July 12, 1948

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

Volume 123 1948

EDITORIAL INDEX, PAGE 51

The Steel Industry, so important to the peace both at home and abroad, has faith in sound economics.

The key to sound economics in our nation today must be found in the time-honored law of supply versus demand.

We further believe that thoughtful cooperation between government and industry, industry and its customers, employer and employee, will keep our country sound and strong.

The Colorado Fuel and Iron Corporation

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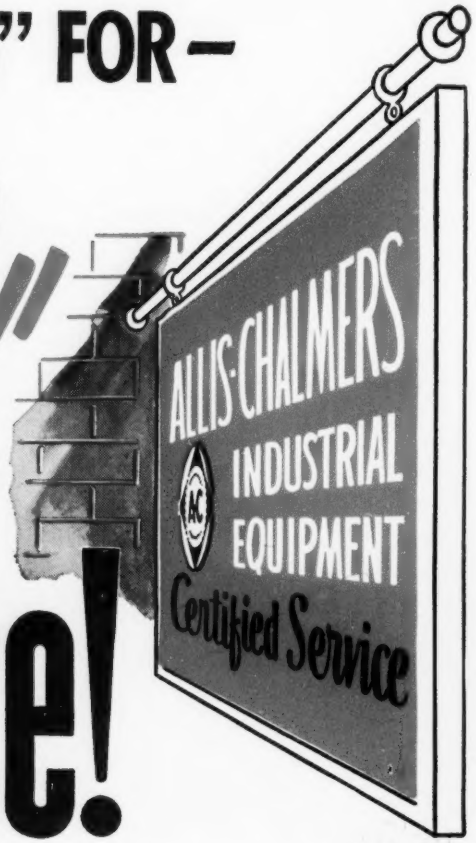

Independent Local Repair Shops Now Being Selected to Give Better, Faster Service — "Certified" Parts and Workmanship—on Allis-Chalmers Motors— Transformers — Controls — and Pumps!

THE NAME "ALLIS-CHALMERS" has always meant good motors, generously built for long life! Now you have an *added* reason for investing in Allis-Chalmers motors . . .

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YOU GET FINEST SERVICE. Every Allis-Chalmers *"Certified"* Service Shop has been selected on the basis of its excellent reputation in the community. It's the kind of shop you *like* to do business with!

How To Get Allis-Chalmers "CERTIFIED" Service:

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NEW MOTORS AVAILABLE!

Many Sizes and Ratings of Allis-Chalmers Standard Squirrel-Cage Motors from 1 hp up are Now Available from Stock. Call Your A-C Authorized Dealer or District Office.

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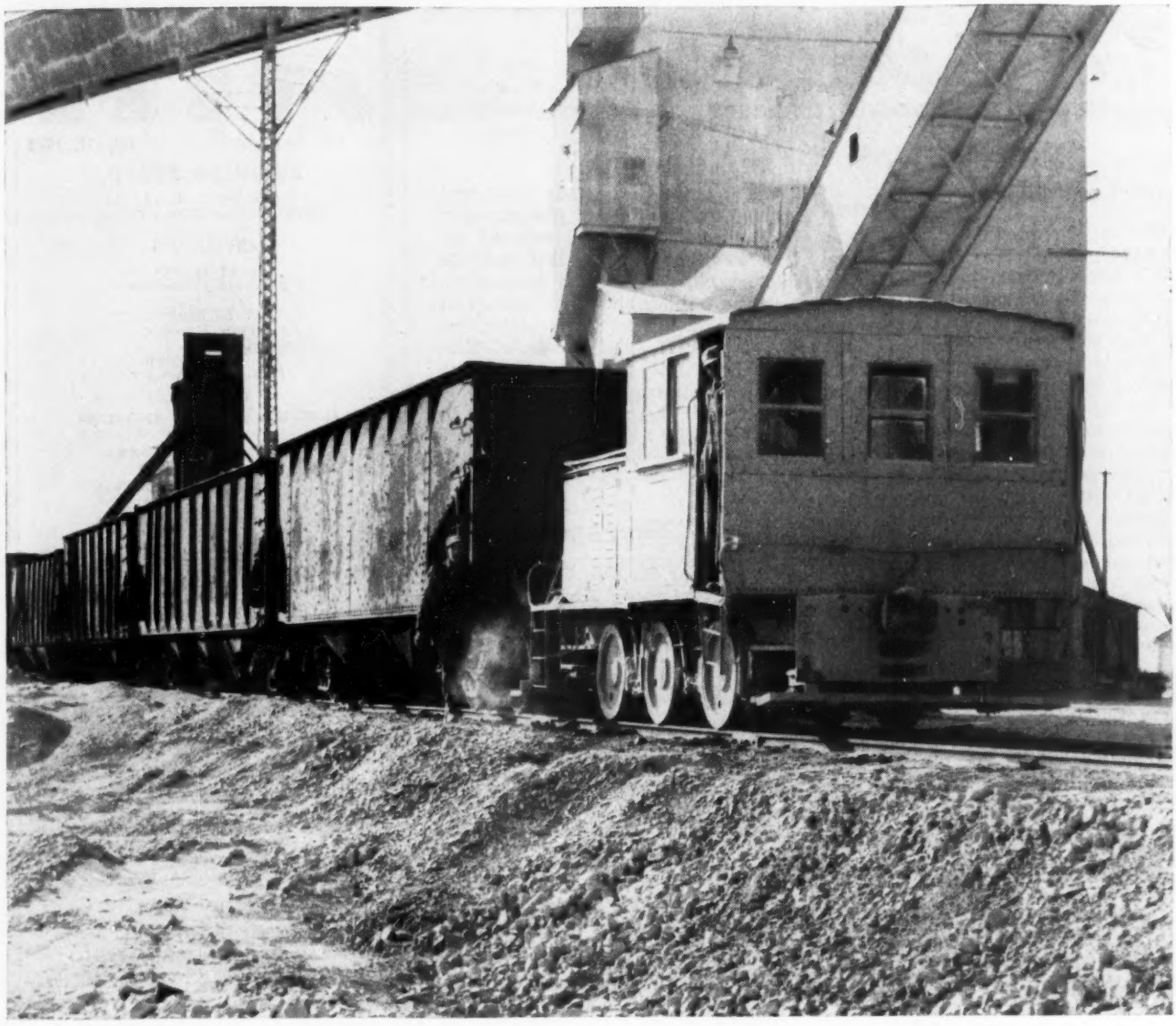
One of the Big 3 in Electric Power Equipment—Biggest of All in Range of Industrial Products



They drive a locomotive with rubber bands

A typical example of B. F. Goodrich product improvement

THAT yard locomotive switches heavy freight cars, loaded with stone, back and forth all day. Its steam engine broke down recently and had to be replaced faster than a new one could be ordered. Someone suggested powering the locomotive with two automobile engines that were on hand. But how to transmit their power to the locomotive's wheels? An engineer recommended B. F. Goodrich V belts for the drive.

16 V belts were harnessed from auto engines to locomotive wheels. The engineer opened the throttle, while the train crew held their breath. Then smoothly, silently, the world's first V-belt-driven locomotive began to pull its string of stone-laden cars. It has run for many months now, so efficiently and economically that it has earned itself a permanent job — another unusual application illustrating the almost unlimited uses of B. F. Goodrich V-belt drives.

Today's B. F. Goodrich V belts are the result of constant improvement, better processes for prestretching cords, for improving cord adhesion, for reducing internal heat and friction with compounds that make rubber run 70% cooler. In these and many other ways B. F. Goodrich belt engineers have successfully attacked the common causes of V-belt failure, and more than doubled belt service life.

Whether it's in V belts, or in any of the more than 35,000 rubber products B. F. Goodrich makes for industry, development work goes on endlessly at B. F. Goodrich laboratories, insuring that rubber serves your business better every day. For first news of developments in your field, see your local distributor or write: *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F.Goodrich

FIRST IN RUBBER

Behind the Scenes...

Read It and Reap

One of the most interesting jobs we have seen in a long time, and certainly unique in its field, is the "Press Directory of Milwaukee Industry," recently issued by the Milwaukee Industrial Marketing Association. This little booklet lists the name and address of thirty-six member companies of the association, the products they manufacture, and the name of the man or men who are regular contacts for representatives of the press together with their home and business telephone numbers. We highly recommend this job for study by industrial public relations men in all our major cities, with the pointed idea of imitation. In fact, we'd like to have copies of any similar jobs which may exist or which may be produced in the future. Man behind this effort was N. H. Jacobson of Allis-Chalmers, the association's PR chairman. Congratulations to him for a good job, and to A. R. Tofte, also of Allis-Chalmers, who is president of the MIMA.

$179 Per Second

In the time it takes you to read this one short item, the steel producing industry will have spent more than $1500 in expanding its facilities to meet the demand for finished steel. At least that's what we deduce after figuring out some figures in "Steel Facts."

Puzzle Corner

The dam engineer with his bulldozer was fifteen weeks behind schedule in our puzzle of two weeks back. Figure it out on the basis of one bulldozer, which would take sixteen weeks to do the job, or fifteen more than the promised one week. From our international following we have this week's puzzle, submitted by A. R. Dordet, a French engineer, who apparently knows what happens to Americans in Paris. He says, "An American executive leaving for France told his secretary, 'If I need more money, I'll cable you three groups of letters. Each letter represents a number, according to this code sheet. The last group will be the amount I want, and will equal the sum of the other two groups.' Sure enough, after he spent a few days in Gay Paree, the boss had to cable for more dough. The cable read 'Send more money.' The gal grabbed the code sheet and started to figure out the amount, but to her dismay, she discovered the boss had left her his last month's laundry bill instead of a code sheet. Can you tell her how much money to send?" M. Dordet, incidentally, together with H. C. Myers Jr. of Midvale both had the correct answer to our swimming pool problem, while we erred. The right answer is 42 feet and not 54 feet, as we so glibly announced last week.

A Hundred Years Ago

One of our favorite little books is the "Chronology of Iron and Steel," published by this printshop a few decades back and now out of print. It lists from prehistoric times up to its publication date the important developments in iron and steel technology and other events affecting the industry. By far the most important event of a hundred years ago, for example, is the entry under 1848 which says that a Scottish immigrant named Carnegie entered the United States, with his wife and two sons, Andrew and Thomas. Few people have influenced American history as much as did that Scottish immigrant boy of a hundred years ago.

Toward Better Relations

We've a special recommendation this week for all our readers who have anything to do with the sales or advertising end of their businesses. That includes you top executives whose principal function is to review advertising schedules and approve or reject them. We have just finished reading the new ABP opus, "Copy That Clicks," and we find it is one of the outstanding jobs of this or any other year on industrial advertising and how to make it pay off. Here you'll find some plenty worthwhile tips on how to make your advertising dollars work harder, backed up by case studies on how other companies have done it and what results they've attained. If you'd like to have a copy, write either to us or to the Associated Business Papers, 205 East 42 St., New York 17.

Shrdlu

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STEEL

Vol. 123—No. 2 July 12, 1948

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Straight-Line Production Techniques for Small Jobs

Fundamentals of Forging Practice

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STEEL

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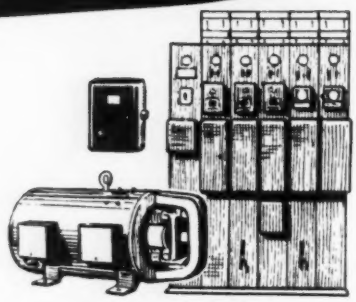
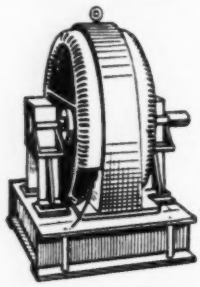
assured by
EP *SPECIALIZATION*



INDUSTRIAL-TRUCK BATTERY-CHARGERS

In 1910, The Electric Products Company introduced the first Automatic Battery Charger.

ASK FOR BULLETIN 203



SYNCHRONOUS MOTORS

From stator frame to rotor windings, E.P. Specialization is your guarantee of long life and trouble-free operation.

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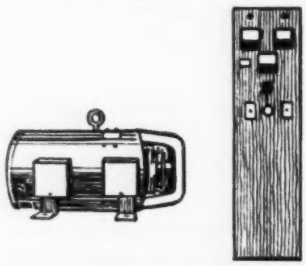


STANDBY BATTERY-CHARGERS

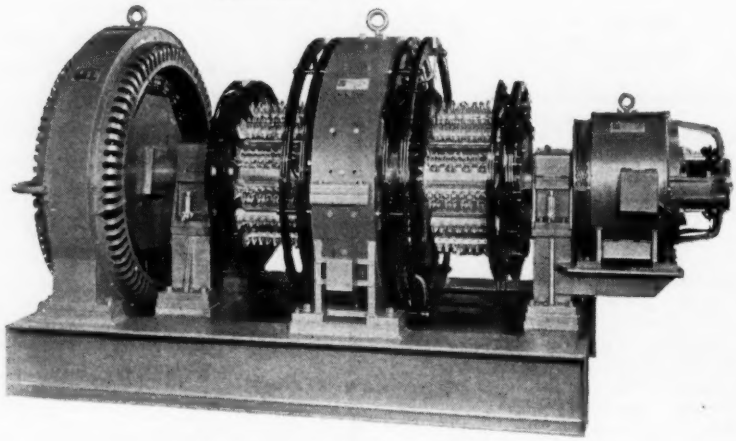
Diverter-Pole Motor-Generators assure maximum battery life, full-automatic operation and protect themselves against harmful overloads.

ASK FOR BULLETIN 207

also
INDUSTRIAL DYNAMOMETERS
SPECIAL MOTORS AND GENERATORS
FREQUENCY CHANGERS
SYNCHRONOUS GENERATORS

THE "*FIRST STRINGER*" IS ALWAYS BETTER

. . . use an EP motor-generator



ENDURANCE, specialized ability and ruggedness . . . these are the three chief differences between the "first stringer" and the "bench-warmer." And they are the main reasons why the E.P. Motor-Generator has been chosen to supply hundreds of thousands of direct-current amperes throughout the metal-working industry for electroplating, electrocleaning, electrotinning, electrogalvanizing, electropolishing and anodizing.

Continuous duty for over twenty years is common for an E.P. Motor-Generator. Tailor-made for the specific electrolytic process, it assures economies unmatched by ordinary commercial machines. Unaffected by the corrosive atmospheres common to most electrolytic operations, it requires no special protective equipment. There's no production "time-out" with an E.P. Motor-Generator.

Where long life is desired . . . where top efficiency is demanded . . . where minimum maintenance is a must, specify an E.P. Motor-Generator.

EP X-37

THE ELECTRIC PRODUCTS COMPANY

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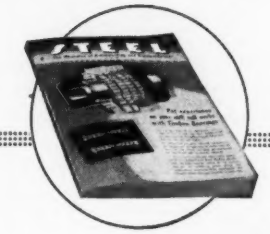


July 12, 1948

Forces Early Showdown

Last Wednesday Benjamin F. Fairless, president of United States Steel Corp., announced that "in the near future" its steel producing subsidiaries will adopt the method of announcing prices for steel products "at the mill or shipping point, or, if the customer so desires, at delivered prices which reflect full transportation charges from shipping point to destination." He explained that abandonment of the basing point system is made necessary by the decision of the Supreme Court in the cement case.

It is expected that other steel sellers will announce similar price policies. The repercussions will be more violent than those that have attended any previous single price action in the steel industry.

At first glance, one wonders why U. S. Steel responded so promptly to untested interpretations of the highest court's decision in the cement case. As a matter of fact, Lynn C. Paulson, trial attorney for the Federal Trade Commission, in an interview with an editor of this publication (p. 46, June 28, 1948) indicated his conviction that FTC commissioners would agree to steel pricing practices involving less drastic changes than those which will be necessitated by U. S. Steel's announced policy.

Again, one may ask why the corporation departed from its previous policy of permitting the government to retain the initiative in pressing its case. Had the corporation not acted so hastily and if matters had been allowed to drift normally, the actual showdown would have been postponed for a considerable period.

Probably U. S. Steel officials reasoned that if they left the initiative to FTC, the showdown—although delayed—might come at a critical period in a buyers' market. For the corporation to take the initiative now would mean that the first evidences of how f.o.b. mill pricing will work will appear in a sellers' market when the repercussions will be at a minimum. Also, the prompt action has promise of clearing the atmosphere, or even of forcing corrective measures, before sellers and consumers find themselves in the midst of a fiercely competitive buyers' market.

As a result of U. S. Steel's decision, the economic soundness of a Supreme Court decision is to be tested almost immediately in the laboratory of actual experience. The outcome of this novel experiment will mean much to American industry.

* * *

POTENTIAL DYNAMITE: Reaction of government spokesmen to the Ploeser amendment in the draft act, which grants mandatory allocation powers to the President, has undergone a curious change in a brief period.

When the implications of the amendment first came to light after Congress adjourned for the political conventions, Department of Commerce officials were of the opinion that the provision for mandatory priorities for materials for the armed services would virtually "kill" the existing voluntary allocation set-up. Shortly thereafter, spokesmen for the armed services declared that the military had no intention of resorting to the mandatory powers granted; they would continue to procure their needs under voluntary allocation. Still later this policy was affirmed by President Truman. He declared that mandatory powers will not be invoked at this time.

This assurance from the highest authority has given the voluntary allocations program a new lease on life. Also, the growing belief that a Republican administration will take over in 1949 is encouraging numerous key career men in

(OVER)

AS THE EDITOR VIEWS THE NEWS

Washington bureaus to display a less antagonistic attitude toward industry and business.

These surface indications that the unusual powers granted the Chief Executive in peacetime are for stand-by purposes only and need not be feared are reassuring. Nevertheless these latent powers are potential dynamite. The President alone can decide what degree of emergency warrants their use. Congress should have retained a check on the President's judgment. —pp. 62, 66

* * *

LOCALIZING MARKETS: It is only natural that sellers and buyers are indulging in conjecture as to how far the steel industry's capitulation to the government's demand for the abandonment of identical delivered prices will spread into other industries. Some persons believe the action of the steel producers may lead to f.o.b. plant pricing of some manufactured products. It has been hinted that even cigarets may be affected.

If consumers items, such as cigarets, were put on an f.o.b. factory basis, public attention would be attracted quickly to the problem now confronted by the steel industry. Should cigarets be sold at higher prices in Chicago than in New York because Chicago is more distant from the Richmond, Va., or Winston-Salem, N. C., factory than is New York?

In short, is localizing of the market for any commodity good or bad for the national economy? —p. 59

* * *

ROAD SHOW RESUMED: Next large exhibition on industry's calendar is the road show of the American Road Builders Association to be held July 16-24 at Soldier Field, Chicago. There 300 manufacturers will utilize 30 acres in which to demonstrate their highway and airport construction materials and equipment. It promises to be the largest show of its kind ever held.

The event will be important from another standpoint. The last road show was held in 1940. Since that time, manufacturers of road building equipment made an enviable record by turning out efficient earth moving machinery which helped win World War II. After the war ended, Japs and Germans alike admitted frankly that they had underestimated the war potential of American bulldozers and similar machines. Since V-J Day the equipment companies have been adapting their wartime experience to machinery for postwar domestic road building. Scarcity of unskilled labor and necessity for cutting costs have intensified the demand for their products.

One can expect eye-openers at the 1948 road show. —p. 65

* * *

OUR SHARE OF SCRAP: In spite of extraordinary effort, the problem of obtaining satisfactory shipments of steel scrap from Europe is far from solution. Shipments are expected to start this month on 40,000 tons from Germany, first of anticipated shipments of 240,000 tons for 1948. Robert W. Wolcott, chairman of the Steel, Foundry & Scrap Industries Committee for Expediting Scrap, suggests the shipping of 2 or 3 million tons of German scrap to assist American steel production.

Now a survey by the Steel Division, Economic Commission for Europe—a United Nations organization—shows Europe to be short 3 million tons of scrap in 1948. UN has appointed a team of scrap experts who are investigating supplies with a view of maximizing collection.

There is enough scrap in Europe to take care of reasonable European needs and to provide more for the United States than we are receiving. Apparently we must overcome unusual obstacles if we are to get our share. —p. 63

* * *

CHECKING POLLUTION: An act of Congress provides new incentives for tackling the problem of water pollution on a river basin scale. The states are to have primary responsibility for controlling pollution and they may draw from a federal fund of $20 million for assistance in the work when the states put up $2 for each federal dollar. The fund is to cover the period from July 1, 1948 to July 1, 1953.

The first compact under the new law is one in which thousands of companies in the iron, steel and metalworking industries will be interested directly. It is the joint agreement by Indiana, West Virginia, Ohio, New York, Illinois, Kentucky, Pennsylvania and Virginia to control pollution in the upper Mississippi and Ohio river systems. Disposal of industrial waste represents a substantial portion of the pollution problem in this area and for this reason industrial firms should be prepared for an early call from the eight states to co-operate in their joint campaign. —p. 68

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

BUYER PAYS THE FREIGHT—Bowing to a quarter-century attack by the Federal Trade Commission on its basing point pricing system, the steel industry is moving toward f.o.b. mill pricing (p. 59). The steel producers don't like the move. They doubt its economic soundness and believe it will be unfair to many consumers. Steel users under present conditions will not object to paying the freight from mills to their plants; they value availability of steel far above price. When more normal conditions return, steel consumers located far from their sources of supply will be placed at a disadvantage to their competitors situated near the mills. Then a howl of protest to Congress and a call for clarification of the national pricing policy is expected to result. Meanwhile, look for plenty of confusion and dislocation in steel marketing.

ALLOCATIONS—Voluntary programs for channeling steel into programs deemed essential are going forward once more, after a hiatus caused by the granting of mandatory priority power to the President under the draft act (p. 62). The President's announcement that he does not intend to use the mandatory powers and his insistence that the co-operative programs continue has given new life to the voluntary plans.

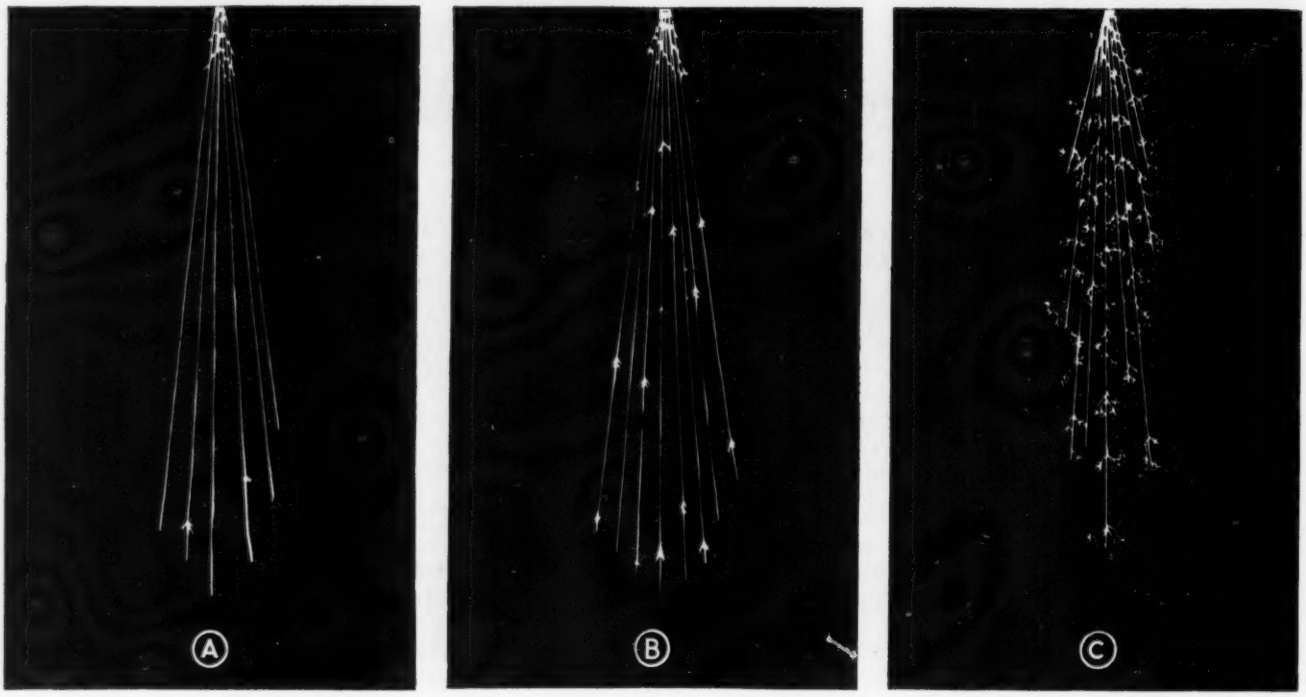
SEVENTH FOR LEWIS—Only minor disruptions in iron and steel production have so far resulted from the strike in the captive coal mines (p. 61). Most mills have comfortable stocks of fuel accumulated since the April strike in anticipation of the current stoppage. This is the seventh walkout called by John L. Lewis in the soft coal mines since the end of the war.

RAW MATERIALS TIGHT—Although iron ore shipments this season are running 5 million tons ahead of last year, blast furnace operators still anticipate scant stocks for next spring (p. 63). Consumption, on a yearly basis, is running close to shipping capacity. . . .Scrap supply, a constant worry to steelmakers since the early days of the war, shows no signs of improvement. Consumption of purchased material now is estimated (p. 63) at 32 million tons annually. Efforts to ship German scrap to this country are being pushed and first shipments of about 40,000 tons are expected to arrive this month.

CUTTING ROAD COSTS—Road machinery builders convening in Chicago this week will emphasize the importance of speed and efficiency as a means of reducing costs in building and maintaining America's highway system (p. 65). Their answer to the problem, of course, is new and modern equipment, much of which will be displayed at the show.

FRIENDLIER ATTITUDE—Government officials in Washington are taking a friendlier attitude toward business, a reflection of the political signs of the times (p. 66). Career bureaucrats are moving to get into line with policies which they expect under a Republican administration and with those set forth by the 80th Congress.

HERE AND THERE IN INDUSTRY—Perfection Stove Co. is entering the gas range field and is completing a $6 million expansion at Cleveland (p. 76). . . . Jones & Laughlin celebrated July 4 by lighting a new 175-ton open hearth at its Otis Works (p. 64). . . .Tube Turns Inc. has acquired Pennsylvania Forge Corp. (p. 76). . . .Ford has introduced its Meteor model in Canada (p. 73). . . .Electro-weld Steel Corp. (p. 71) is doubling its tubing manufacturing capacity in California. . . .Sterling Steel Foundry Co. at Pittsburgh, has been acquired by a group of refrigeration equipment manufacturers (p. 64) who will use its ingot output in conversion deals to obtain flat-rolled steel. . . .Detroit machinery sellers are hopeful for improved business resulting from impending developments in the automotive field (p. 74). . . .Important gains are being made in European steel production (p. 69).



Mark your answers here. Carbon content of steel A. is __% B. is __% C. is __% Correct spark readings are given at lower left

Can You Read These Sparks?

They Describe the Analyses of Three Steels

Steel bars of three different analyses gave off the sparks pictured above when touched by a revolving abrasive wheel. At Ryerson, we "read" these sparks to protect your production.

To the trained eyes of our experts, the spark pattern of a steel is as distinctive as a fingerprint. For example, the sparks shown here indicate straight carbon steels, with carbon content in the low, middle and high ranges. If chrome, nickel, molybdenum or other alloying elements were present, they would also be revealed in the spark pattern.

That's why spark testers patrol the bar sections of your nearby Ryerson plant. By checking all alloy and special quality carbon bar stock, they guard against mixed shipments. Help to assure the certified quality of Ryerson steels.

HERE ARE THE ANSWERS:

A—.10% B—.35% C—.95%

Spark testing is only one of many extra steps we take to make Ryerson a steel source you can call with confidence. Another—the special Ryerson Report sent with each alloy shipment. It charts the results of hardenability tests, shows how to heat treat for desired mechanical properties and includes other helpful data.

So play safe. Avoid the possibility of mixed steels by ordering from your nearest Ryerson plant.

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BARS—carbon & alloy, hot rolled & cold fin., reinforcing
STRUCTURALS—I beams, H beams, channels, angles, etc.
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STEEL
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Steel Consumer Pays the Freight

Steel industry adopts f.o.b. pricing system reluctantly. Serious disruptions to both mills and metalworking companies expected to result

METALWORKING industries are facing serious dislocations as result of the steel industry's reluctant move toward an f.o.b. mill pricing system.

Steel consumers in the future will pay the freight. A steel user located far from his source of supply will pay much more for material delivered to his plant than a competitor who is closer to the steel mill. Under normal competitive conditions, this might force the remotely located metalworking plant either to move closer to its source of supply or to go out of business.

This is the consensus of industrialists in appraising the forced abandonment of the multiple basing point pricing system, announced last week by United States Steel Corp. in compliance with recent Supreme Court decisions.

Opposition to the f.o.b. mill pricing system appears to be overwhelming among both steel producers and steel users. So sharp are their objections that heavy pressure is expected to be exerted upon Congress for a definitive clarification by law of the entire pricing situation.

Action Forced by FTC

Steel industry pricing methods have been under attack by the Federal Trade Commission for many years. Last week the leading producer, U. S. Steel, announced it was abandoning the traditional basing point system and soon "will adopt the method of announcing prices for steel products at the mill or shipping point, or, if the customer so desires, at delivered prices which reflect full transportation charges from shipping point to destination."

Bethlehem Steel Co. followed suit and others indicated they would take similar action. Some may wait until they learn the procedure to be followed by leading producers.

Many expect that higher steel prices, necessitated by rising costs and by an anticipated wage increase to be granted steelworkers, may be announced when the new pricing system becomes effective.

Adoption of the f.o.b. mill pricing system in itself will result in an increase in steel prices to the majority of steel users. Currently, mills are absorbing substantial freight charges, which vary from customer to customer but which are estimated by mills to average from 80c to $1 a ton.

B. F. FAIRLESS
Voices serious doubts on economic soundness of pricing change

May Spread to Other Industries

The steel industry's capitulation to the FTC demand for abandonment of identical delivered prices lends strong belief that similar pricing systems in other industries, possibly extending down to such items as cigarets, may also be forced out. Thus, metalworking companies which are selling their products on a delivered price basis may be forced to quote f.o.b. mill.

Such action would tend to localize their markets, just as the f.o.b. mill pricing system for steel may restrict the markets of the steel producers.

This may force many regional industries to migrate, either because they cannot afford to import steel or export their product or both.

As a result of U. S. Steel's announcement, International Harvester Co., Chicago, revealed it is studying the possibility of changing its pricing system on farm machinery.

Hardship May Be Delayed

Full impact of the pricing change will be delayed. At the moment, the steel consumer's prime interest is in availability of steel rather than in price. He will gladly pay the freight charges if he can get steel.

Return of an approximate balance between steel supply and demand and the return of competitive pricing will force closer attention to competitive costs.

Metalworking companies in most of the industrial centers and in practically all of the outlying districts are opposed to the change, according to a survey by STEEL's editors.

Midwestern steel users look on f.o.b. mill pricing with disfavor and fear serious confusion will follow its adoption. Chicago is a larger steel consuming area than a producing area, and substantial tonnages of steel are imported from other producing districts.

Consumers in New England and down into the upper Mid-Atlantic states pay more under the f.o.b. mill system. New England freight rates range from 18 cents a hundred pounds from Worcester to Boston on carlots of bands and wire products to 67 cents from Ohio and Pennsylvania mills.

Pittsburgh steel users might benefit by the new system. By the same token Pittsburgh producers will be hurt more than those of any other district.

"No Other Recourse"

U. S. Steel made it clear that the action was taken reluctantly and President Ben Fairless said the corporation had no other recourse but to comply with the interpretation of the law by the Supreme Court.

"The abandonment by these subsidiaries of the basing point method of selling steel—a merchandising practice not resulting from collusion, but one which has developed naturally by evolution in the steel industry over the past fifty years to the mutual advantage of both steel producers and consumers—is made necessary by the recent decision of the

Supreme Court of the United States in the proceeding brought by the Federal Trade Commission against members of the cement industry. In that case, the Supreme Court held that the basing point delivered price system employed in the cement industry (which is generally similar to that now in use in the steel industry) is an unfair trade practice which the FTC may suppress.

"We have no recourse other than to comply with the law of the land as determined by the Supreme Court, regardless of hardships and dislocations to industry which may result.

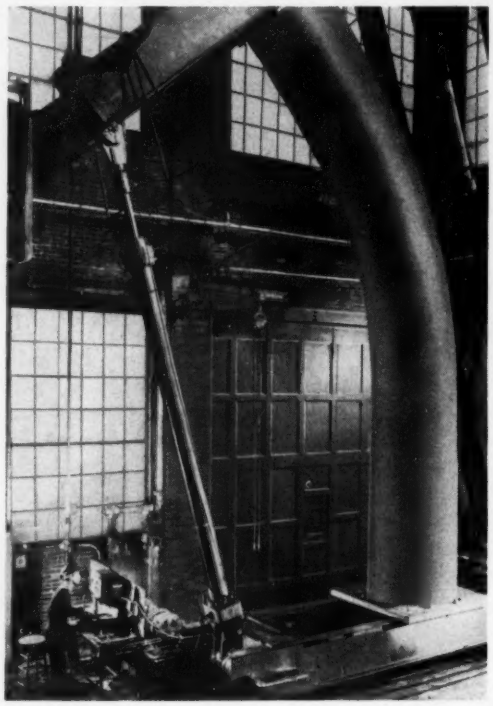
"In the past, these subsidiaries have competed for steel business in geographical areas where competitors nearer to the buyer have freight advantages. In order to compete, our subsidiaries normally have quoted delivered prices low enough to equal the delivered prices of the competitor located nearest to the prospective customer. In our judgment, we were fully justified in meeting in good faith the price of a more favorably located competitor. Competition was stimulated and not hindered by such a practice. Naturally, meeting competition in this way has resulted in differences in the net proceeds of the producing steel mill on sales of the same product to different customers located at different places. This is evidence of competition, not of its absence.

"But the Supreme Court has now ruled that the right to meet an equally low price of a competitor does not permit 'a seller to use a sales system which constantly results in his getting more money for like goods from some customers than he does from others.' The Supreme Court attached importance to 'individual competitive situations,' suggesting that there might be exceptions in particular individual cases. However, it is unrealistic to suppose that these subsidiaries can market satisfactorily more than 50,000 tons of finished steel each day throughout the year without the use of a standard merchandising method, fully understood by both buyer and seller.

Doubts Advisability of Change

"The management of United States Steel believes that the systematic meeting of delivered prices of competitors is essential to the maintenance of competitive industry in this country and is of great benefit to many businesses, both large and small, throughout the United States. This practice of meeting competition through the absorption of freight is widely followed in American industry. Despite our serious doubts about the advisability and economic soundness of this radical change in our subsidiaries' marketing methods, we feel that they have no alternative other than to comply with the decision of the Supreme Court of the United States."

(For list of U. S. Steel mill locations, see Page 162.)



BIG BENDER: M. W. Kellogg Co., spurred by oil refinery needs, has perfected a process and apparatus to bend pipe up to 100 inches in diameter. Pipe in the hot state is bent under hydraulic pressure. Method currently is being employed to fabricate 50-in. pipe bends, as shown in the picture, for the carrier lines of large oil refining units

"How Much More for Steel?" Automakers Ask

WHAT will happen to Detroit area delivered prices on finished steel now that leading mills have moved in the direction of establishing f.o.b. mill prices was the big question haunting the minds of automotive steel buyers last week. They conceded steel probably will cost more delivered to their plant but what they wanted to know was how much more.

Under the so-called "Detroit arbitrary" switching charge, sheet and strip buyers here paid the Cleveland or Gary, Ind., base price plus 21 cents per hundred within Detroit switching limits and 28 cents per hundred in eastern Michigan and Toledo, O. Great Lakes Steel Corp., within the switching limit and supplying roughly 20-25 per cent of the cold-rolled sheet and strip used by the motor industry, is able to deliver steel to most large users in the area at a freight cost somewhat under the arbitrary, when moved by rail. Truck shipments of smaller quantities are more costly but still probably within the arbitrary.

Arbitrary Aids Outside Producers—One purpose of the arbitrary delivery charge was an effort to put outside mills shipping into Detroit at less of a freight disadvantage. Now Great Lakes is faced with the alternatives of pricing sheet and strip at the prevailing base quotations in Cleveland and Gary and calling this the f.o.b. mill price, tacking on whatever actual freight is involved, or naming present Detroit delivered prices which include the 21-cent arbitrary as the f.o.b. mill figure and adding freight to that. In view of steadily mounting costs and the likelihood of an imminent wage increase, the latter course appears the most logical.

Freight from Pittsburgh to Detroit is 46 cents per hundred, from Cleveland 34 cents, from Gary 44 cents, from Buffalo 40 cents, from Youngstown 39 cents, from Weirton, W. Va., 46 cents. These figures show the amount of freight absorption facing outside mills in these areas when shipping to the motor plants in Detroit. Today the question is largely academic, since users will gladly pay the freight just to get the steel. When the market turns competitive again, the outlook will be vastly different.

May Help Auto Supply—In the short-range view, the automobile industry may be able to obtain additional steel by paying the freight,

since there has been a tendency of mills to withdraw from areas, like Detroit, where the arbitrary switching charge covers only about half the actual amount of freight involved. Customers of local mills obviously will enjoy a price advantage, others who have encountered reticence from mills in the Chicago, Youngstown, Pittsburgh and other remote districts over making shipments into Detroit and absorbing 18-25 cents freight may now be able to get on the books of these mills if they are willing to pay the full freight bill.

Once steel mills again begin to scramble for automotive tonnage, buyers here can pick and choose to their advantage.

Lewis Strikes Again

Lewis ordered to court as seventh postwar coal strike starts. Production loss small

SCATTERED interruptions to blast furnace, steel plant and foundry operations were caused last week by the seventh postwar coal mine stoppage.

The strike centers around the "captive" coal mines owned by steel producers and resulted from the refusal of the captive mine owners to sign an agreement giving the miners a union shop without an election by the miners. Such a contract, the steel producers hold, is in direct violation of the Taft-Hartley Act. Captive mine owners were willing to grant the $1 a day pay increase and to double their contribution to the miners' welfare fund.

Walking out "in sympathy" with the workers in the captive mines were nearly 40,000 employees of commercial mines.

Lewis Ordered to Court—Miners' Chieftain John L. Lewis late last week was ordered by Federal Judge T. Alan Goldsborough to appear in court July 14 to show cause why the union should not be ordered to end the strike. The action was taken on request of Robert Denham, general counsel for the National Labor Relations Board, who formally charged Lewis with failure to bargain in good faith and with forcing the captive mine owners to discriminate against their employees. An injunction against Lewis and the union is being asked.

Mills Well Stocked—Coal inventories at coke ovens and steel plants at the start of the strike were fairly comfortable. Steel mills, in anticipation of a miners' strike, purchased coal in the open market during May and June for stockpiling, sometimes paying premium prices. Stocks of coke ovens by June 1 had increased to 7,762,000 tons, or 29 days' supply, from 4,308,000 tons, 20 days' supply, on May 1. Steel plants and rolling mills had increased their stocks from 771,000 tons, 28 days' supply, on May 1 to 1,074,000 tons, 41 days' supply, on June 1. This accumulation continued during June although exact figures at the start of the strike are not available. However, many steel companies place their overall stocks at 40 to 45 days' supply.

These generally comfortable stocks are allaying fears of an immediate and widespread disruption of steelmaking operations. Many companies believe normal operations can be maintained for two or three weeks at least. Should the captive mine strike be prolonged, there is the possibility of steel mills continuing to buy coal in the open market.

Foundries Hit—Some curtailments were noted last week. A number of foundries in northern Ohio were forced to curtail and at least one closed completely when pig iron shipments were cut off due to shortage of coke at suppliers' furnaces.

National steelworks operating rate dropped 6 points to 89 per cent in the holiday week.

C-I Explosion Idles 5 Furnaces

NOISE and spectacle of Fourth of July celebrations were no equal for the tragic events at South Chicago Works of Carnegie-Illinois Steel Corp. on July 3. In an explosion and fire which injured 27 persons and killed one, the blowing room supplying wind to its blast furnaces was wrecked. Damage was estimated at $1 million.

Five furnaces were idled by the calamity, but by the end of last week two were scheduled to be back in blast; a third was due on by the middle of this week, and the remaining two may be back in operation within three weeks.

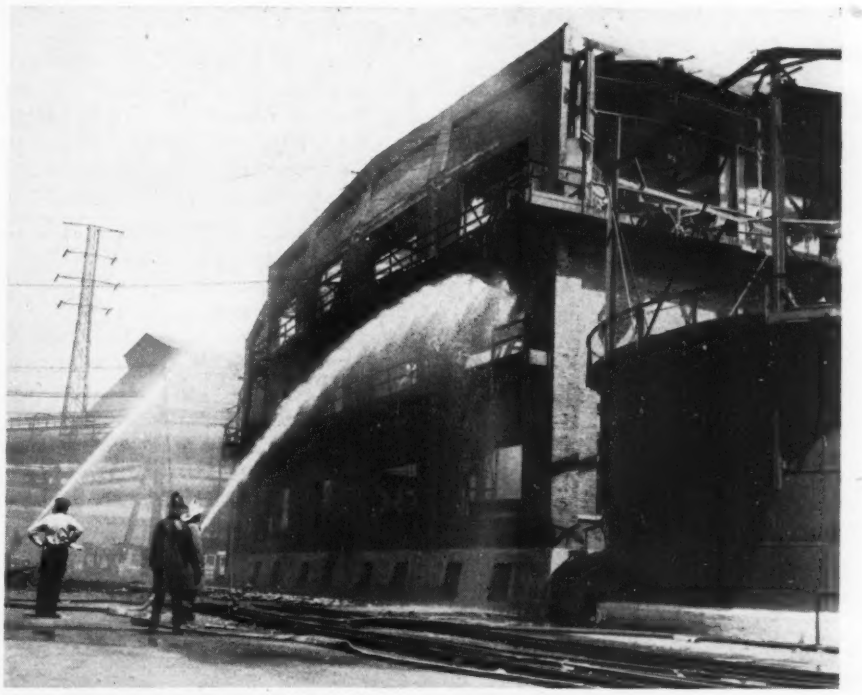
With all five furnaces down, weekly production loss was about 4500 tons of iron and 10,000 tons of ingots.

Westinghouse Boosts Prices

THIRD round wage increases have brought new price boosts for some of Westinghouse Electric Corp.'s industrial and power equipment and home appliances.

A five-per-cent jump on large electric motors, engine-driven generators, motor-generator sets, gear motors and various items of switchgear apparatus restores prices in many instances to their April, 1948, level at which time the company reduced prices on the average of 5 per cent. At the same time Westinghouse increased prices of all standard control equipment manufactured at Beaver, Pa., 10 per cent.

New prices on home appliances represent an average increase since Jan. 1, 1948, of 7.1 per cent on electric ranges, 5.7 per cent on refrigerators, 3.3 per cent on water heaters and 4.9 per cent on small appliances.



EXPLOSION RIPS THE ENGINE HOUSE AT CARNEGIE-ILLINOIS' SOUTH CHICAGO PLANT

Voluntary Allocations Get Green Light

President gives blessing to co-operative action. Says administration will not invoke mandatory allocation powers granted in draft act at this time

VOLUNTARY allocations program for steel, the life of which was jeopardized by the Ploeser amendment to the draft act granting mandatory allocation powers to the President, has passed its crisis and again is going ahead under full steam.

President Truman gave the program a blood transfusion by declaring that the mandatory powers would not be invoked at this time. He has asked Secretary of Commerce Charles Sawyer to proceed to develop voluntary allocations programs under Public Law 395, and to work closely with the military officials in the formulation of these programs.

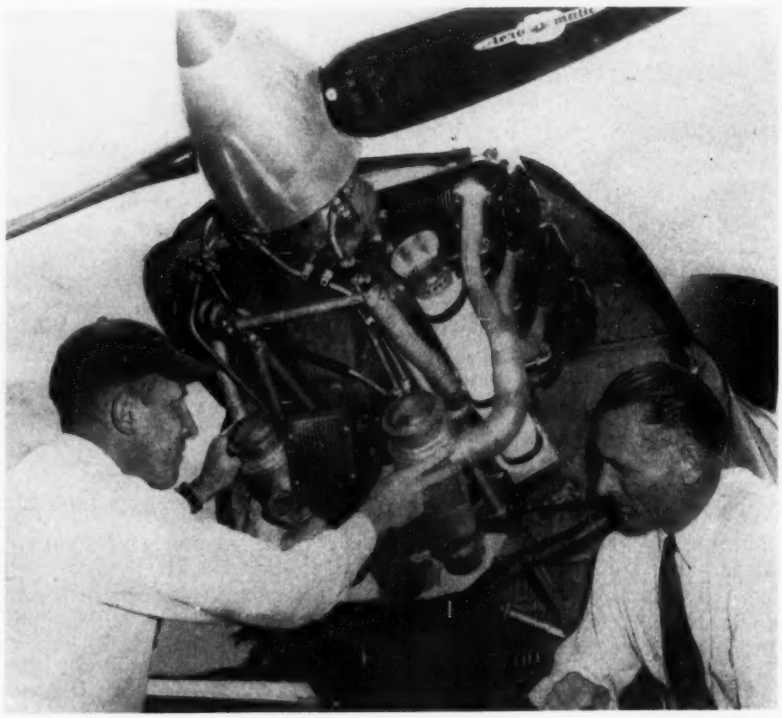
The President's statement apparently removed the threat of overriding competition from mandatory allocations and the Office of Industry Cooperation is preparing to widen rather than curtail its activities.

Study Military Requests — OIC is studying the request of the Army, Navy and Air Force for a total of 1,269,131 net tons of finished rolled steel during the fiscal year ending June 30, 1949. Though the Justice Department has issued no pronouncement as to the eligibility of military steel under the voluntary program, the President's statement, presumably cleared with Justice, is taken by the OIC as granting full authority. The OIC is planning to call in the steel advisory committee soon for a conference on military steel requirements.

OIC also is preparing to work on the President's request that stockpiling requirements be allocated under voluntary agreements. Figures indicating the quantities to be acquired for stockpiling are being compiled by the Munitions Board. A number of new industry committees, including representatives of the nonferrous metals and minerals industries, will be created to take care of stockpiling needs.

Hardship Plans Revived — Plans also are under study as to how small consumers can get small tonnages of steel in cases of dire need. Last week, following a conference with Senator Wherry, OIC Director John C. Virden sent out an exploratory letter to steel producers, merely pointing out the need for developing some method of taking care of hardship cases among steel consumers. No definite formula was suggested.

Still another project on which the OIC is working is the organization of a domestic scrap drive. In general, this is aimed at getting the principal scrap generating industries to clean house and get all possible scrap into trade channels so that it will flow to consumers.



PLANE SILENCER: CAA engineers successfully test a noise eliminator at San Francisco. Called an "Aircraft Engine Exhaust Silencer and Back Pressure Reducer" by its inventor, Curtiss Davis who intends to market the gadget, the device is a lightweight "venturi" tube so mounted that the prop wash creates a slip stream that sucks the exhaust through a series of sound baffles and jets it out the rear. NEA photo

Clarifications Sought

WHILE new life was given the voluntary allocations program by the President's directive of July 1 and also by a general belief that Congress will extend Public Law 395 when it convenes in January, many points of confusion remain to be clarified. Department of Justice has been asked to rule on the following:

1. Apparent contradiction in Public Law 395, which in one place sets May 1, 1949, as the expiration date and in another allows programs to be executed for another six months.
2. Whether voluntary allocations programs could be set up and executed even though Public Law 395 expires, through granting of antitrust immunity.
3. Status of industry-paid men.
4. Whether foreign aid requirements can be handled under voluntary allocations agreements.

Hearing on Prefab Allocation

PUBLIC hearing on the proposed voluntary agreement for allocation of 59,000 tons of steel sheet and strip for prefabricated steel houses will be held at 10 a.m. July 14 at the Department of Commerce auditorium, Washington.

The allocation was protested when first proposed. The Steel Products Industry Advisory Committee noted its disapproval of the allocation but recommended approval when asked to do so by interested government agencies.

Some consuming groups have indicated they will appear to protest the allocation at the open hearing.

Persons wishing to participate in the hearing may file notice of ap-

pearance with the director, Office of Industry Cooperation, Department of Commerce, Washington 25, D. C., by 5 p.m. July 12.

Ore Shipments Gain

Annual movement of 83 million tons anticipated, but winter stocks still will be scant

MORE IRON ORE was moved down the lakes this season to July 1 than in any comparable period since 1942.

This progress is doubly significant to steel producers and consumers. It means not only that current ore needs are being met but that headway likely will be made in replenishing ore stocks which at the beginning of this shipping season dipped to a 30-year low at lower lake ports and furnaces.

To July 1 this year's movement of Lake Superior ore from upper lake ports totaled 31,013,896 gross tons, according to the Lake Superior Iron Ore Association, Cleveland. How this accomplishment stands out is seen in the following comparison with the records for like periods of the years since 1939:

	Gross Tons		Gross Tons
1948	31,103,896	1943	24,793,890
1947	26,278,719	1942	33,952,166
1946	13,000,454	1941	28,825,921
1945	29,024,586	1940	17,268,690
1944	29,376,930	1939	9,231,249

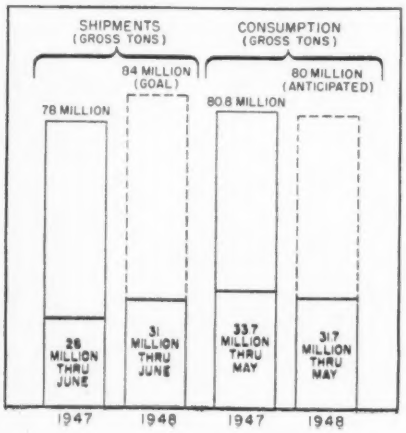
Last year total movement of ore down the lakes was 77,898,087 gross tons, even though only 26,278,719 tons had been shipped up to July 1. With this year's attainment by July 1 approximately 19 per cent ahead of that on the comparable date last year, and if good shipping weather prevails the rest of the current season, the total movement this year should be not less than 83 million tons, compared with last year's 77,898,087 tons.

Because of the coal miners' work stoppage, consumption of Lake Superior iron ore to June 1 this year totaled only 31,764,063 tons, compared with 33,730,770 tons on the like date of last year. In view of the steel production loss and inasmuch as steel ingot operations for all of 1947 averaged 92.9 per cent it is unlikely that operations the rest of this year can boost ore needs in 1948 much above that of 1947's 80,806,627 tons. Consequently, there should be at least three million tons to add to stocks from which blast furnaces must draw their needs until the 1949 lake shipping season opens.

The 30-year low to which stocks had dropped by Apr. 1, 1948, was an uncomfortable 16,022,253 tons—about a two-months' supply.

Most of the gain in ore shipments this season is attributed to the fact approximately 26 Canadian vessels are in the United States ore trade, compared with about a half dozen last year. The U. S. Great Lakes ore fleet at the opening of the 1948 season had about the same trip capacity, although fewer vessels than at the beginning of the 1947 season.

While the 1948 season opened at approximately the same time of year as that of 1947 the tonnage moved in the early weeks of the 1948 season was considerably larger than that in the initial weeks of the 1947 season.



Scrap Use Jumps to New High

WITH consumption of purchased steel scrap in March at an annual rate of 32 million tons, compared with about 28 million tons in 1947, the scrap consumer feels more than ever like a man trapped on a "down" escalator trying to go up.

Brightest prospect for a reversal in the futile trend of rising scrap consumption and declining supplies lies in the Commerce Department action which sent Robert W. Wolcott, chairman of the Steel, Foundry & Scrap Industries Committee for Expediting Scrap, to Germany to assist Alfred Hirsch, OIC representative, in pushing shipments of German excess supplies to the United States. New scrap consumption rate, explained Mr. Wolcott recently, is essential to maintain a high steel output and cannot be maintained without development of new supply sources. Export of 2 or 3 million tons of German scrap to this country would aid in solving the U. S. metallics problem.

Shipments This Month—Shipments are expected to start this month on 40,000 tons in Germany, first of an anticipated 240,000 tons to arrive on this side of the Atlantic over the remainder of the year. The currency reform has pried this tonnage loose, and the price will be around $26 f.a.s. Germany, with the delivered price Atlantic seaboard at approximately $38.

Mr. Wolcott denied recent contentions that scrap should be left for German conversion into products, thereby reducing demand for exports of iron and steel products from America. This argument, he said, overlooks the fact that Germany couldn't possibly use over 1,500,000 tons annually and that 10 million tons are available.

C. A. Ilgenfritz, vice chairman of Mr. Wolcott's committee, pointed out that although no steel companies are now being forced to cut production because of lack of scrap, such will not be the case by next winter when **a shortage such as we have never experienced will result if something isn't done. This country's total inventory of scrap and pig iron is currently only 40 per cent of what it was just prior to our entrance into World War II and substantially less than the lowest wartime inventory.**

Europe Has Scrap Shortage, Too

EUROPE will be short by well over 3 million tons of scrap in 1948, and the bulk of the excess supplies in Germany should go to other European nations, rather than to the United States.

This opinion, directly opposed to that of Mr. Wolcott and other Americans interested in scrap, was inferred in a recent survey by the Steel Division, Economic Commission for Europe, a United Nations body. Equitable distribution of German scrap, according to the survey would include shipments to the United States, but nothing like the 3 million tons envisaged by Mr. Wolcott. Prewar practice called for American exports to Europe (in 1937: 1,848,000 tons; in 1938: 1,443,000 tons; and in 1939: 1,220,000 tons).

Explanation for the general European scrap shortage lies largely in the fact that there is a scarcity of metallurgical fuel. Measures had to be taken to make the most economical use of coke and to produce the highest quantity of steel with the limited availabilities of coke. Richer ores had to be used and consequently more scrap had to be added in the blast furnace, the final result being that scrap consumption has jumped sharply. The situation is so acute, according to the survey, that the United Nations has appointed a team of scrap experts who are investigating the supplies, country by country, with a view of maximizing collection.

Ingot Source Assured

Refrigeration equipment makers buy Sterling Steel Foundry, expand its capacity

ANOTHER steel producing facility moved into the hands of steel consumers July 1 when five refrigeration equipment manufacturers, all members of the Frozen Food Institute, New York, bought Sterling Steel Foundry Co., Pittsburgh.

Negotiations for the purchase were carried through by John P. Ludgate Associates, Pittsburgh, with O. W. Harrington, Baltimore, and John S. Lear, Pittsburgh, as consulting engineers. A reported $500,000 was involved in the transaction.

The facility will be expanded and renovated at a cost of nearly $2 million, with the major work consisting of increasing the capacity of two 35-ton acid open hearths to 50-ton capacity and converting them into basic units, installing a new 35-ton acid open hearth, and adding a new charging crane, platform floor, etc. Loftus Engineering Corp. will construct the new furnace and rebuild the present ones. When the expansion program is completed, the company's ingot capacity will be raised to about 8000 tons a month.

Aug. 1 is the date set for completion of changeover and enlargement of one open hearth, with the new furnace expected to be in operation in three to four months. Through July the remaining furnace will be pouring on old contracts. New castings orders will be accepted on a deferred delivery basis until the new unit goes into operation.

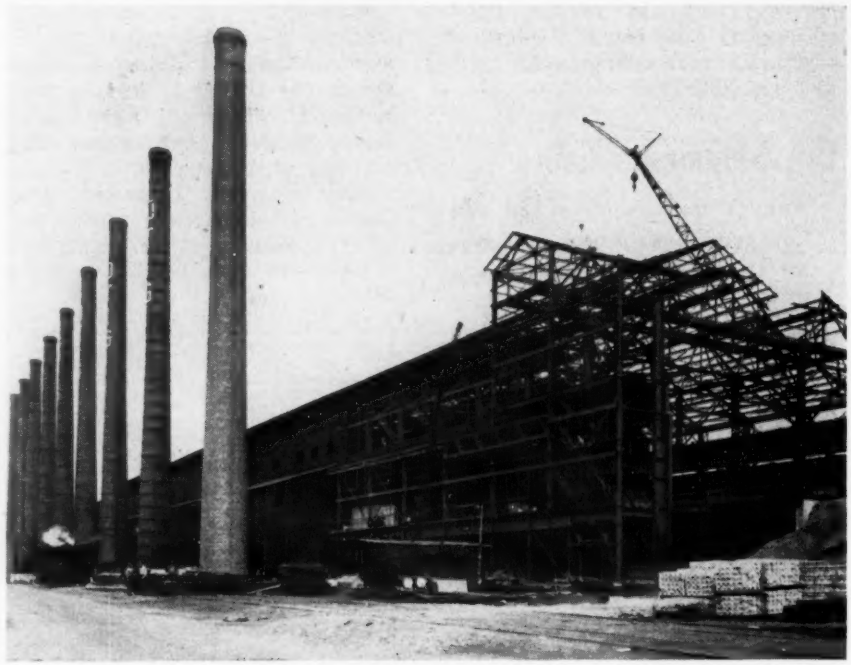
The manufacturers participating in Sterling's purchase are to be allotted proportionate shares in the company's ingot production, and will arrange individually for conversion in outside mills. These equipment makers previously have had rolling mill commitments for ingots bought in the open market.

New president of Sterling is Dr. G. Hodges Bryant, board chairman of the Frozen Food Institute.

J & L Charges New Open Hearth

INCREASE in steelmaking capacity at Jones & Laughlin Steel Corp.'s Otis Works, Cleveland, became effective last week with charging of a new basic, stationary open hearth.

This raises the works' number of open hearths to nine and boosts steel ingot capacity from 829,000 net tons yearly to approximately 900,000 tons. The new open hearth, first one to be built at the works since 1928, has a rated heat capacity of 175 tons. It was constructed by the Loftus Engineering Corp., Pittsburgh, and cost $2 million.



New open hearth (foreground) photographed when under construction went into operation last week at Jones & Laughlin's Otis Works

Under other projects at the Otis Works, production of a blooming mill and sheet and strip mills is being improved and increased. Reports have been circulating that a 30-in. strip mill at the Otis Works will be sold to Alan Wood Steel Co., Conshohocken, Pa.

American Bantam Buys Newgren

STOCK transfer deal, affecting the managements and ownership of three companies—American Bantam Car Co.. Butler, Pa., Monroe Auto Equipment Co., Monroe, Mich., and Newgren Co., Toledo, O.—has been negotiated.

American Bantam has purchased Newgren, a subsidiary of Monroe, and in exchange for Newgren's stock is issuing a new class of stock for Monroe's ownership.

The Newgren firm manufactures specialized farm equipment for use on Jeeps manufactured by Willys-Overland. A hydraulic lift manufactured by Monroe is incorporated in these attachments. American Bantam, now making cargo trailers, will continue their manufacture while using excess capacity for producing many Newgren products and possibly some of Monroe's.

Bantam in making the purchase enlarged its board of directors to include Brouwer D. McIntyre, president and general manager of Monroe, William D. McIntyre, executive vice president and treasurer of Monroe, and Charles S. McIntyre, Monroe vice president, secretary and general sales manager. Brouwer and William McIntyre were elected president and executive vice president, respectively, of Bantam.

Emerson To Open Aircraft Plant

EMERSON Electric Mfg. Co., St. Louis, announces that the United States Air Forces have authorized the activation by the company of the former Walworth plant located at Washington Park in St. Clair county, Ill. Facility will be used for the manufacture of aircraft turrets with associated electronic equipment relating to aircraft armament.

The equipment to be produced will be directly connected with the new 70-group air force program and the accompanying expansion of the Naval air arm. Emerson recently was awarded contracts for the design and production of electronic-controlled aircraft gun-firing mechanisms for new types of jet-powered bomber aircraft, as well as for conventional long-range reconnaissance and patrol planes.

Washer, Ironer Sales Soar

IN LESS than six months this year the household washer manufacturing industry forged ahead of its entire 1946 sales and bested its six-month 1947 sales by 30 per cent, according

to the American Washer & Ironer Manufacturers' Association.

During the January-May period, latest for which complete figures are available, the industry sold 1,873,090 standard-size units, with May's total being 362,658, down 8 per cent from April. Sales of ironers in the five-month period aggregated 237,802, up 10 per cent from the comparable 1947 period. May sales were 44,954 units, compared with 47,319 in April.

Cutting Highway Costs

Road machinery manufacturers to stress efficiency and speed at Chicago exposition

GROWING NEED for cost-cutting ideas in adapting highways to present-day traffic is expected to give road machinery manufacturers an exceptional sales and promotional opportunity at the approaching road show and convention in Chicago.

Not only are $1½ billion worth of roads to be built in 1948 but it is estimated by the American Road Builders' Association, Washington, that it will cost $22 billion to rescue the nation's highways from war-enforced neglect and obsolesence and restore them to at least prewar status. "We must build roads better and faster and we must utilize every possible means for keeping costs down," says J. T. Callaway, ARBA president.

The show, which will start July 16 and continue through July 24, will be held at Soldier Field where 300 manufacturers will use 30 acres of display space for the largest exhibit of highway and airport equipment and materials ever assembled. Value of the exhibits is approximately $15 million. Among the 500 major units on display will be giant machines, some of them 100 feet high and weighing more than 100 tons.

The approaching show is the first since 1940. Concurrently with the show the 45th annual ARBA convention will be held in the Stevens Hotel.

Attendance is expected to reach 100,000, with approximately 54 foreign nations represented.

Oliver Corp. at Century Mark

AN INDUSTRIAL oldster, the Oliver Corp. of Battle Creek, Mich., is having its sprightliest year and in celebrating its centennial during this month announced that its newest offspring will be working on farms next year.

A feature of the celebration was the introduction of a new line of tractors incorporating a new type power takeoff and having six forward and two reverse speeds. Also announced for future production was a new and smaller "baby" tractor.

The company, which has plants at Battle Creek, Springfield and Cleveland, O., South Bend, Ind., Shelbyville, Ill., and Charles City, Iowa, expects sales this year to climb to an all-time peak of over $100 million for a gain of 35 per cent over last year. Since the war, an expansion program aimed at doubling productive capacity has been under way which to date has cost about $20 million. By next year when the program is completed $27 million will have been spent.

G-M Exports Diesel Know-how

DIESELIZATION of the railroads of Australia and the Far East was brought closer when Clyde Engineering Co., Granville, New South Wales, Australia, signed an agreement with Electro-Motive Division of General Motors Corp. providing Clyde with Electro-Motive's know-how in diesel manufacture. Major components of locomotives will be shipped to the Australian firm until the new industry can be built up in that country. Sales-service organization and facilities of G-M American type will also be supported by the agreement.

The Clyde company, a leading producer of steam locomotives and other transportation equipment, which this year celebrates its fiftieth anniversary, hopes the first locomotives to be manufactured under the agreement will be in service by 1950.

GE Turbine Output at New High

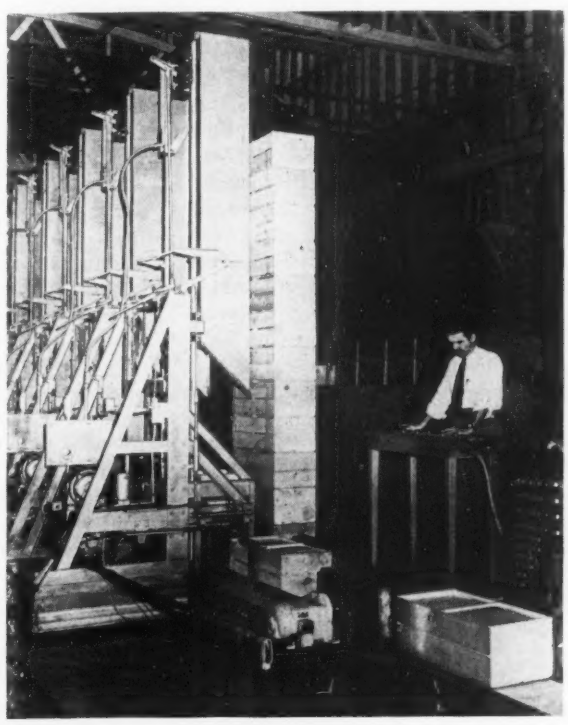
GENERAL Electric's Schenectady turbine plant during the first six months of 1948 produced turbine-generators with a combined kilowatt capacity greater than that of all the units manufactured at the plant in 1947, a high production year, J. W. Belanger, manager of the Turbine Divisions, has announced.

In the half-year period 30 units representing 1,237,500 kw were built and tested. Some of these units already have and others soon will be installed by utility companies in 16 of the 48 states and one foreign country, France. Thirty-four turbine sets with a total capacity of 1,173,750 kw were shipped out of Schenectady last year.

Steel Men Go Back to School

ONE hundred Republic Steel Corp. operating men will return to their jobs next fall with a mission. After completion of a course at Baldwin-Wallace College in Berea, O., this summer, they will take to their various Republic plants a new knowledge in quality control and work simplification which they will pass on to their colleagues.

Republic has had the work simplification study program in effect since 1935, but formal instruction in quality control is now being added.



RIGHT SORT: Food Machinery Corp.'s automatic segregator does everything but push its own buttons as it sorts containers by sizes, grades or colors. At right is device's "magic brain" which enables operator to make selections by pressing proper buttons

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Washington attitude toward business becomes increasingly friendly now that signs point more conclusively toward Republican victory this fall

A FRIENDLIER attitude toward business is increasingly prevalent in Washington. The trend has gained momentum on the basis of public opinion polls indicating the likelihood of a Republican victory this fall, and particularly since the selection of the Dewey-Warren ticket. Politically-weatherwise career men in the government are moving to get in line with policies which they expect under a Republican administration. **They are doing this mainly by weighing present policies against the overall philosophy laid down by the 80th Congress—both as to laws it enacted and also the bills it permitted to die off.**

Perhaps the greatest change will be noted in policies of the Justice Department and the Federal Trade Commission. Justice now is weighing its 16-year ban against inviting trade association executives into conferences between government and industry advisory committees, and chances are good that it will at least modify it.

Justice got a rude shock when Congress passed the Reed-Bulwinkle act over the President's veto; this is the bill which authorizes the railroads to fix rates in concert under the supervision and approval of the Interstate Commerce Commission. Its enactment knocks out some cases which Justice was prosecuting against the railroads.

May Reverse Its Stand—Another possibility is that Justice will reverse its previous position that Public Law 395 would have to be revised to permit allocations of steel for the armed services and the Economic Cooperation Administration under voluntary agreements. In fact, President Truman's announcement on July 1 that the military would not use the Ploeser mandatory-priorities amendment of the Selective Service Act, but would try to get their steel under the voluntary allocations program, resulted from National Defense Establishment reasoning that this Ploeser amendment has slipped in as a "sleeper" and that the real intent of Congress was to have voluntary rather than mandatory allocations. Military brass hats expect Justice approval in their desire to get in under the voluntary allocations program.

FTC Changes Thinking—As to the Federal Trade Commission, there is reason to suspect that a profound change has come about in the thinking about pricing policies. Just how this came about is not definitely discernible, but the fact that the Capehart subcommittee is about to undertake a thorough investigation of the business effects of its policies may have had some influence. So might the fact that the O'Hara bill to strip the FTC of all judicial powers and make it merely a prosecuting agency was favorably reported by the House Interstate and Foreign Commerce Committee and probably would have been approved at least by the House.

Then, if the Republicans win the election, the majority on the commission would consist of Republicans. Anticipating the election results, the Senate failed to confirm the reappointment of Commissioner Garland S. Ferguson, a Democrat. If he is replaced by a Republican favorable to business, the chances for more understanding treatment of business by the FTC will have been improved—for Commissioners Robert E. Freer and Lowell B. Mason already have demonstrated that they are averse to policies unduly disturbing to business.

Willing To Settle Steel Case—At any rate, the basis on which Trial Attorney Lynn C. Paulson is willing to undertake to settle the present steel case, is radically different from FTC precedent. All that Mr. Paulson wants (STEEL of May 31, p. 72, and June 28, p. 46) is: 1—Each mill must have an f.o.b. mill price and be willing to sell at that price when requested by consumers to do so; 2—the American Iron & Steel Institute must discontinue publication of books of freight rates from mill to consuming locations. Mr. Paulson would permit the various steel companies to meet delivered prices of others to their heart's content. He is even willing to permit steel companies to continue exchanging information as to costs of extras, if it is shown that orderly conduct of the steel industry in the public interest requires such an arrangement.

Mr. Paulson thinks he has a good chance of getting commission approval should he be able to effect a settlement on this basis. Should there be a Republican majority in the commission next year, such a settlement probably could materialize without difficulty.

The above examples are cited merely to illustrate the nature of shifts in policy which are contemplated or which are beginning to become effective in Washington. Many more might be cited. They all add up to the fact that, in the expectation of a Republican victory, and a final repudiation of the New Deal, more and more friends of business in the government are coming out in the open.

There's Room for Economy

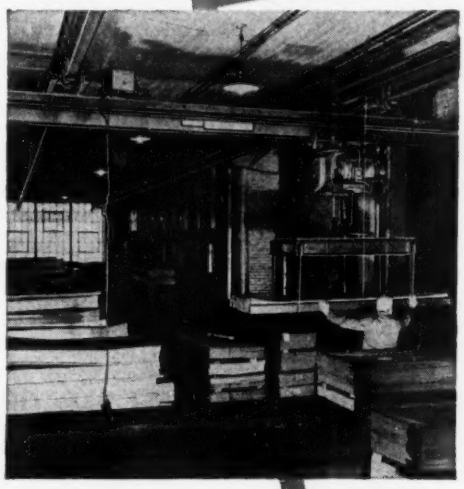
WHETHER THE COST of running the federal government will be reduced should the Republican ticket emerge victorious in this year's elections is a question of prime importance in Washington where the federal payroll is the backbone of the economy. On the basis of his performance in New York, Thomas E. Dewey's election would be regarded as paving the way to important economies. Furthermore, he would have the benefit of the extensive studies of the Hoover commission whose report on reorganizing and streamlining the administrative branch of the government is due next year.

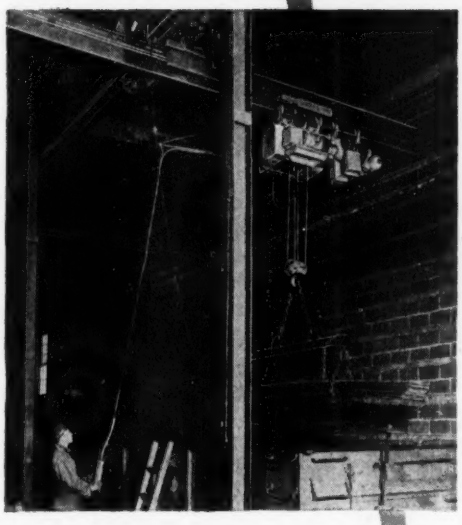
Without an intensive, well-directed economy drive from the White House, there can be no sharp reduction in the cost of government. Congress alone cannot do the job, as Congress historically has been unable to offer effective resistance to raids of pressure groups on the public treasury.

Nothing exact is known at the moment as to the cost of government in fiscal 1949 under Democratic administration, and under appropriations of a Republican Congress. The Bureau of the Budget is getting the figures together and the President will announce them before the end of July. There will be a lot of controversy about the figures he publicizes, as to whether they are reliable, fully informative and whether they cover what is purported. Of only one thing is there certainty at the moment: Fiscal 1949 will be the most expensive peacetime year in history from the standpoint of cost of federal government.

The federal payroll always is a pretty good indicator of the trend in cost of government, and this is

5-Ton Low Headroom MONORAIL CRANES





AMERICAN MONORAIL 5-Ton Cranes furnish efficient operation where headroom is a critical problem. Twin-bridges with carrier mounted between bridges bring load clearance to uppermost limit for extreme low headroom operation. American MonoRail Low Headroom Cranes operate by cab or from floor by finger-tip control. Interlocking devices permit carrier to travel beyond craneways. Loads are moved over maximum area, every square foot of operating and storage space is served. Cranes can be installed under present operating conditions without excessive structural changes.

An American MonoRail Engineer will be glad to discuss the possibilities of crane operation in low headroom areas regardless of the type of handling.

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going up at a rapid pace. A computation by John Cramer, government employment expert of the *Washington Daily News,* indicates that reductions in federal personnel due to reduced appropriations will come to 10,000 to 15,000 in fiscal 1949. But agencies that are to expand will need 150,000 more people. The result will be a net gain of 135,000 to 140,000 in the number of government employees.

Biggest reduction will be via the War Assets Administration which is slated to go out of business Feb. 28, 1949.

Authorized increases in personnel are as follows: Post Office 20,000, Air Force 15,000, Navy 10,000, Army 60,000, ECA and other Marshall Plan agencies 1800, Commerce 3000, Internal Revenue 2500, Agriculture 35,000, Veterans Administration 10,000, National Labor Relations Board 1000, other agencies 3000.

These gains will raise the number of names on the federal payroll to around 2,200,000. As of last January it was slightly less than 2,000,000.

Nickel Suit Settled

ANTITRUST suit of the U. S. government against the International Nickel Co. of Canada Ltd. and its United States subsidiary has been terminated by entry of a final judgment, without trial and without any finding that the companies have violated any law.

The consent judgment, entered in the Southern District of New York, disposes of action started May 16, 1946. Under the judgment any special or regular forms of nickel rolling material which International Nickel may be supplying to its own rolling mill at Huntington, W. Va., for production of nonferrous high-nickel rolling mill products are to be supplied also to other United States rolling mills which may desire to make these particular products. Prices are to be as favorable as the company's general prices for nickel sold to the ferrous and other large nickel consuming fields in the United States. In addition, the Huntington mill will give a number of libraries copies of a manual describing processes that mill employs in using special forms of nickel rolling material.

Major portion of the company's nickel sold in the United States, however, is used for alloy steels and other applications and is not affected by the judgment.

Under the decree International Nickel, if it should have occasion to sell nickel rolling material to other foreign producers of such material or of rolling mill products, shall not make it a condition of sale that such producers not import their own production into the United States.

The judgment recognizes International Nickel's position as a Canadian company and expressly provides that the company is not restricted from doing anything outside the United States which is called for under the laws of Canada or of other countries.

FRANCE SIGNS: French Foreign Minister Georges Bidault signs ERP agreement. Americans looking on are W. Averell Harriman, second from right, ERP ambassador to Europe, and Jefferson Caffery, right, U. S. ambassador to France. NEA photo

End of River Pollution Sought

INDUSTRIES in the upper Mississippi and Ohio river systems will be subjected to an intensive investigation to determine whether they are contributing excessively to pollution, and, if they are contributing, what preventive measures can be taken.

Under an act of Congress, water pollution is to be tackled on a river basin scale, with states given the primary responsibility for controlling pollution. To assist the states, Congress provided for the period of from July 1, 1948, to July 1, 1953, $20 million in federal money for use when states provide $2 for each federal dollar.

First compact under the new law is a joint agreement by Indiana, West Virginia, Ohio, New York, Illinois, Kentucky, Pennsylvania and Virginia to control pollution in the upper Mississippi and Ohio river systems.

When states manifestly ignore their responsibility or when pollution and its effects become interstate problems, the United States Health Service is authorized to step in. It also is empowered to file suit against industrial plants which cause pollution.

Joins Scrap Advisory Office

NEW ADDITION to the Iron & Steel Negotiating Division of the Office of Industry Cooperation is Philip Smith, who has been in the scrap iron and steel business 21 years as a member of the firm of Joseph Smith & Sons Inc., Washington. He will be an industry advisor and will assist Alex Miller, OIC chief industry advisor on scrap. Mr. Smith was granted a temporary leave of absence to take the government assignment.

The Job Falls to Him

A DEATH and two resignations leave Assistant Secretary of Labor John W. Gibson the ranking head of the U. S. Department of Labor, and thereby technically the labor official in President Truman's cabinet. However, this ranking is expected to be only temporary, a number of men having been mentioned for the post of Secretary of Labor to succeed the late Lewis B. Schwellenbach.

The 37-year-old Mr. Gibson, a CIO member and a former milk man, became the ranking head of the department after David A. Morse, undersecretary, and John T. Kmetz, assistant secretary, resigned following the death of Mr. Schwellenbach.

World Ups Steel Output

Saturation point of steel demand seen far off, but situation shows gradual improvement

THE DAY when world-wide steel production again comes into balance with demand unquestionably is some distance away, but almost every month brings news of gains made in this direction.

On the European continent, for example, Belgium, Luxemburg and France have made vast strides since the days of their liberation and are again becoming aware of the facts of competition in economic life.

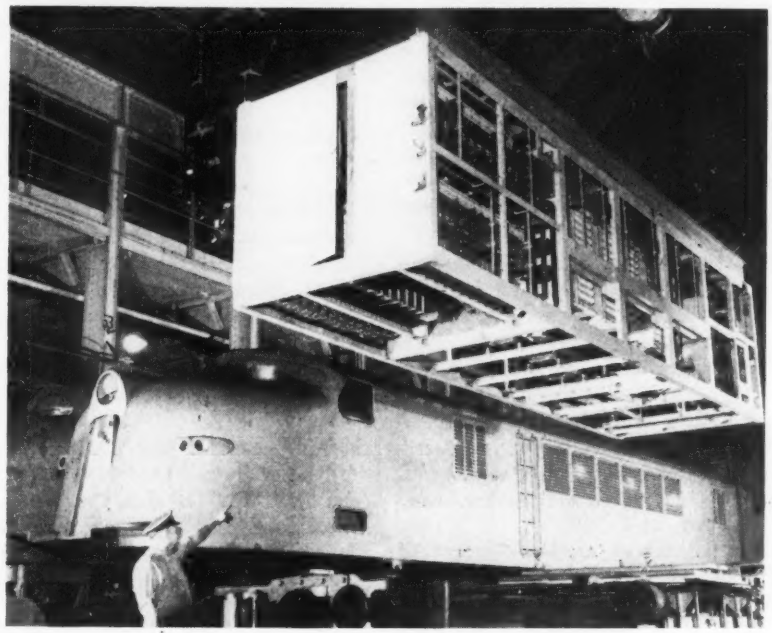
England, too, provides ample proof of her determination to heal war wounds and better her standard of living through increased production.

From more distant parts of the world also come indications that with more steel more people can prosper. India, as a case in point, has steel production of close to 1.5 million tons, only one-third of current estimated needs, and is embarking on a steel expansion program which in relative scope may dwarf any past expansions in other countries.

Mysore Iron & Steel Works at Bangalore, India, plans to raise its output of both iron and steel by 300 per cent. Other companies have similar projects in contemplation, although as in every other spot on the globe raw materials present problems which will not be solved in a few months or, probably, even in a few years.

Is Germany the Key? — Looking again at the European continent and its steel situation, it appears Germany holds many of the answers. The German people's struggle to overcome the quite-natural desire of other countries to surpress Germany's industrial economy and leave her with only a pastoral existence have been largely successful. And fairly general realization has come that recovery throughout Europe will depend in considerable measure on German recovery. A German likens his country to a well equipped blacksmith's shop owned by an experienced and willing smith whose anvil is now broken. All the smith needs is a new anvil before he can make many of the products his neighbors are desperate for.

Increasing attention is being given to restoring the productive capacity of the smith's shop now, with American policy, particularly, being one of helpfulness in re-establishing part of the industrial might which once characterized Germany.



BUILDING BLOCKS: These "building blocks" at Westinghouse's East Pittsburgh works will add up to a 182-ton electric locomotive when assembled. Switch control unit is shown here being lowered into the locomotive body. In final assembly, the body will rest on the truck in the foreground. Locomotive will be one of six for Central Railways of Brazil

England's Output Up — England's steel production, aided by a somewhat improved raw materials supply and by large-scale modernization and expansion programs, has risen to an annual rate of over 15 million tons, remaining above that figure throughout the first five months of the year.

The $200 million Abbey Works of Steel Co. of Wales is typical of the new British determination to revive its industry. This plant, the biggest one under construction in Europe and the British Isles, however, will not be in full operation until 1952.

The long-range nature of Britain's plans emphasize the knowledge that the saturation point for steel is a long way off. The country's auto industry and its shipbuilders are most vocal in their demands for more steel. Allotments to the car builders are large enough to deal only with export requirements and to touch a fringe of the domestic demand; the shipbuilders contend more steel is needed if the ships to carry other industries' products to the rest of the world are to be built.

Steelmaking Revolution? — More spectacular than the new plants being built and the continuing efforts to solve the materials shortages is the recent new development in steelmaking practice claimed by the Wolverhampton firm of Ductile Steel Ltd. This Midlands company's process, it says, produces steel billets from "light scrap and other metals . . . fused with a mixture discovered by our inventor and melted into the finest quality steel ready for pouring."

What the "other metals" and the mixture are is the company's secret, but, according to it, are available in unlimited supply in the Midlands.

A new record for steel production

MAN BITES DOG

When an industry asks that a government subsidy be diminished, that's news!

The British Iron & Steel Federation has volunteered to absorb part of the abnormally high freight cost on imported ore, which has previously been paid from public funds. In accepting the offer the government increased the maximum prices for basic and hematite pig iron, refined iron and semi-finished steel. The industry's contribution to offset the freight charges will amount to about $9 million a year. The government's subsidy will be reduced to approximately $28 million.

at 350,000 metric tons was scheduled for June in Belgium. April output had been 306,210 tons for a new peak and brought the four-month average to 321,000 tons or 116 per cent of the 1936-1938 monthly average. Improvement in the coal situation has made possible an increase in the number of blast furnaces now blowing.

The satisfactory showing made by the Belgian and Luxemburgian steel industry since the war has helped maintain the countries' export position, and now although Belgian prices are high, strong demand is foreseen until British and American competition becomes more active. Domestically, deliveries of rolled steel products have improved despite increased demand.

This favorable situation was marred by a five-day walkout in the metallurgical industries. On the complaint that the cost of living has not been reduced to the extent promised by the government and spurred by communist agitators, the workers asked for sizable wage increases and other concessions but received only a 5 per cent boost and increased holiday and ration allowances.

Price Cuts Quell Strikes

PARIS, FRANCE

NEW WAVE of communist-inspired strikes throughout France was quelled almost as quickly as it begun. Higher wages were the object, but the government announcement of price reductions on a multitude of objects did more to disorganize the strikers than did the batons of the French police.

Controlled prices for steel mill products were lowered in varying amounts depending on the products—tin plate, for example, was cut 8 per cent; sheets for automobile bodies 8 and 6 per cent depending upon quality; wire rods, hoops and galvanized sheets 5 per cent; and sheets 2 and 3 per cent depending upon gage.

These reductions, carried down to the retail level, are reflected in 4 per cent lower prices on automobiles and motorcycles, 5 per cent on bicycles, 3.5 per cent on tractors, and between 2 and 6 per cent on household items such as tin cans, etc.

Helping make these reductions possible is the rising production in the basic industries. Steel production, for example, set a postwar record in April at 124 per cent of the 1938 average. May production of steel was down to 588,000 tons against 641,000 tons in April, due to a three-day holiday in the latest month, but iron production was up slightly to 562,000 metric tons from 553,000 tons in April.

Meetings . . .

July 16-24, American Road Builders' Association: 1948 convention and road show, Soldier Field, Chicago. Association headquarters are in the International Bldg., Washington.

July 21-23, American Society of Civil Engineers: Summer convention, Olympic Hotel, Seattle.

July 26-27, Institute of Scrap Iron & Steel Inc.: Midyear meeting, Ambassador Hotel, Atlantic City, N. J. Institute executive vice president is E. C. Barringer, Dupont Circle Bldg., Washington.

Aug. 10-13, First Western Packaging Exposition and Conference: San Francisco Civic Auditorium, San Francisco.

Aug. 24-27, American Institute of Electrical Engineers: Pacific general meeting, Spokane, Wash. Institute headquarters are at 33 W. 39th St., New York.

Sept. 7-20, Department of State: First inter-American conference on conservation of renewable natural resources, Denver.

Sept. 13-17, Instrument Society of America: Third instrument conference and exhibit, Convention Hall, Philadelphia. Society headquarters are at 1117 Wolfendale St., Pittsburgh.

Sept. 20-25, American Mining Congress: Metal mining convention, San Francisco.

Sept. 27-Oct. 1, Society of the Plastics Industry: Third national plastics exposition, Grand Central Palace, New York. Society headquarters are at 295 Madison Ave., New York.

Sept. 28-Oct. 1, Association of Iron & Steel Engineers: Annual convention and exhibit, Public Auditorium, Cleveland. Association headquarters are 1010 Empire Bldg., Pittsburgh.

Oct. 1-2, Southern Ohio Section of Open Hearth Committee, Iron & Steel Division and Ohio Valley Section, AIME: Annual fall meeting, Deshler-Wallick Hotel, Columbus, O.

Oct. 5-7, American Institute of Electrical Engineers: Middle eastern district meeting, Washington. Institute headquarters are at 33 W. 39th St., New York.

Oct. 11-13, National Lubricating Grease Institute: 16th annual convention, Edgewater Beach Hotel, Chicago. Institute headquarters are at 4638 Mill Creek Parkway, Kansas City, Mo.

Facts for Industry . . .

Aluminum Wrought Products

Shipments of aluminum wrought products at 133,385,000 lb in May were 4 per cent under April shipments but were 25 per cent higher than in May, 1947. Plate, sheet and strip shipments of 101,879,000 lb were 5 per cent below the April volume. The remainder of the total consisted of 14.8 million lb of rolled structural shapes, rod, bar and wire; 15.6 million lb of extruded shapes, tube blooms and tubing; and 1.0 million lb of powder, flake and paste. *Census Bureau, Commerce Dept.*

Magnesium Wrought Products

May shipments of magnesium wrought products were 13 per cent below the April total of 516,000 lb, although at 448,000 lb they were 6 per cent higher than the May, 1947, shipments. *Census Bureau, Commerce Dept.*

Water Heaters

Nonelectric water heater shipments in April totaled 172,548 units, valued at $7.6 million, compared with 173,291 units and $7.7 million in March. Compared with last year, April shipments were 29 per cent lower. Production in the latest month dropped to 173,875 units from the March total of 182,808 units. Shipments of range boilers amounted to 52,123 units in April and production was 50,953 units, compared with March totals of 58,908 and 63,292 units, respectively. *Census Bureau, Commerce Dept.*

Porcelain Enameled Products

Activity in selected metal-base porcelain enameled products totaled $4.8 million in April, 4 per cent less than in March. The April total included $3.8 million of finished enameled products and $1 million of receipts of enameling done on a jobbing basis. During March finished enameled products were valued at $4.1 million and jobbers receipts had a valuation of $984,000. *Census Bureau, Commerce Dept.*

Cast Iron Boilers, Radiators

Production of cast iron boilers amounted to 22.7 million lb in May and output of cast iron radiators and convectors amounted to 5.2 million sq ft. The May boiler output was 61 per cent above the April figure, but shipments of 19.8 million lb valued at $3.3 million were only slightly above those for the previous month. Radiation production was 9 per cent above the April total. Shipments increased from 4.8 million sq ft in April to 5.1 million sq ft in May. *Census Bureau, Commerce Dept.*

Western Tube Mill Expands

Electroweld to double capacity . . . Gas company swaps for Arabian line pipe

THE CURTAIN has been opened on a new act of the still unfolding western drama in which the aircraft, shipbuilding and steel industries have already put in stellar performances. The tubular goods industry is playing a significant part in this latest act.

The villain in the piece is now the shortage of steel, but as in all good melodramas the hero, through his resourcefulness, is surmounting all obstacles to achieve a happy ending.

A newcomer to the West, the Electroweld Steel Corp. at Azusa, Calif., bids fair to attract the critics' attention for its performance. The company, which began operation of its tube mill early in 1947 now has under way an expansion program aimed at doubling its present plant. Its goals are set on a capacity figure of one million feet of welded steel tubing a month, and before its program is completed it expects to set up a tube fabricating unit to cater to the requirements of the automotive and aircraft industries.

When the company was organized by John S. Crowl, president, and his son, C. A. Crowl, vice president and general manager, they brought to the West Coast the experience they had gained while operating Oil City Boiler Works, Oil City, Pa., now owned by Jones & Laughlin Steel Corp. They also brought with them a firm belief the West Coast would afford fertile soil for a tubing maker, that the conditions were right and the market was well established for this product. What they didn't have at that time was a steel supply.

Now, however, the Kaiser Fontana mill has recognized the strength of the demand for Electroweld's products and is supplying much of the company's raw materials. The expansion is being undertaken because of indications that steel strip will be available in needed quantity.

Consolidated Averts Pinch — Fear that steel pipe production by Consolidated Western Steel Corp. would be curtailed by the ban on shipments to the Middle East has been allayed, and one domestic pipe consumer and thousands of gas users will profit by the government's action.

The newly acquired U. S. Steel subsidiary has been producing pipe for the Trans-Arabian Pipe Line Co. under a contract for 900 miles of the product. Approximately 300 miles had been turned out and 250 miles shipped when the government suspended export licenses.

Rather than have this pipe lying around waiting for the day the government lifts its export ban, a trade was arranged between Tennessee Gas Transmission Co., Houston, Tex., and Trans-Arabian. Under its terms the Houston firm gets 255 miles of pipe (64,000 tons) to complete construction of a natural gas line now being laid between Wharton, Tex., and Natchitoches, La. In return for this pipe, Trans-Arabian will eventually get the pipe scheduled for delivery to Tennessee Gas in fourth quarter of this year.

The pipe obtained by Tennessee Gas will permit completion of the natural gas line in time for the winter season and will step up the flow of gas from the Texas to the Appalachian area by 50 per cent.

Lone Star Pays Off WAA

LONE Star Steel Co. has untied the last knot in an apron string linking it to the government, and on July 1 stepped forth as a full-fledged private steel producer upon complete payment of the balance, over $4,700,000, it owed War Assets Administration.

Outright purchase of the Daingerfield, Tex., plant and three Oklahoma coal mines culminates long negotiations over disposal of the war-born facilities. Lone Star was organized originally to lease the plant, but later decided to buy it, with the help of more than 3000 Texas stockholders. Chief property in the unit includes a blast furnace built at cost of $35 million.

Strike Failing, Boeing Says

STRIKE at the Boeing Airplane Co. Seattle plant is backfiring in some of the strikers' faces, according to statements by the company that production is continuing and the working force is being augmented with recruits from outside. Furthermore, increased worker efficiency and more subcontracting has reduced the number required to man the Seattle plant by 5000.

June deliveries of B-50 Superfortresses aggregated six with two of the planes going into Air Force hands in the final June week. Since May 1 11 Superforts have been delivered. The company's military and commercial order backlog now stands at approximately $300 million.

Small Firms Band Together

BOON to small western manufacturing and contract shops may be provided by a new trade organization, Small Industries of Northern California Inc., Oakland, Calif. The association will act as a central clearing house for sub-contract work, will attempt to open channels for materials and equipment to its members at more favorable prices, and will work to provide more efficient and economical operation through co-operative sales, purchasing and manufacturing programs.

Membership consists of small companies in the following fields: Machine work, die-casting, sand casting, stamping, plastic molding, forging, industrial finishing, welding and sheet metal, electrical, and others.

Rise in Carloadings Seen

ONLY in the Southwest and Trans-Missouri-Kansas regions is the volume of freight carloadings expected to be less in the current quarter than in the similar period of 1947. The nation, as a whole, will load 3.7 per cent more cars, to bring the aggregate to 9,138,374. On the basis of estimates prepared by the 13 Shippers Advisory Boards of the Association of American Railroads 21 of the 32 commodities studied will show increases in carloadings.

Among those showing the greatest increases are the following: Vehicle parts, 13.6 per cent; agricultural implements and vehicles, 12.8 per cent; gravel, sand and stone, 10.1 per cent; lime and plaster, 7.5 per cent; machinery and boilers, 7.4 per cent; cement, 7.2 per cent; brick and clay products, 6.5 per cent; coal and coke, 6.2 per cent; iron and steel, 6 per cent; fertilizers, 5.9 per cent; automobiles and trucks, 5.4 per cent; chemicals and explosives, 5.1 per cent; and paper, paperboard and prepared roofing, 4.1 per cent.

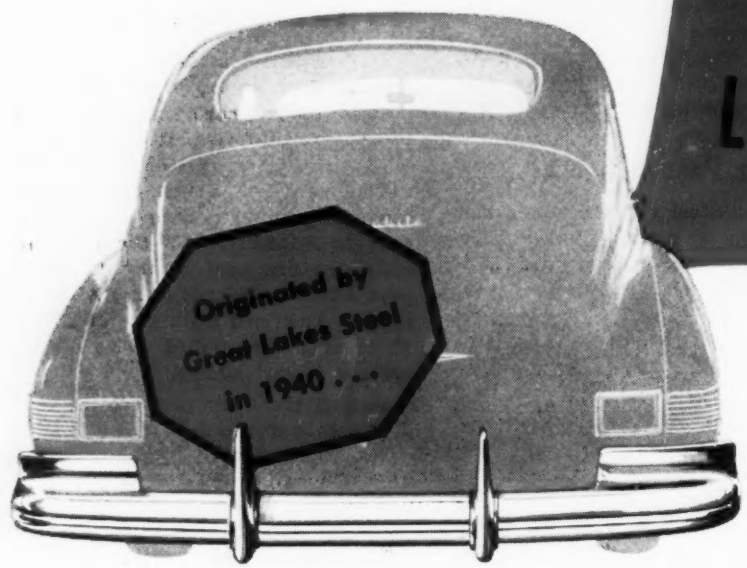
Facts Sought on U.S. Buying

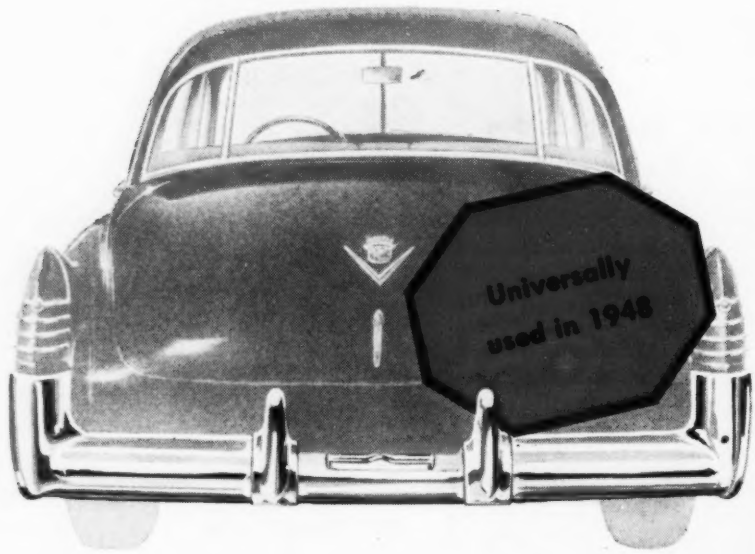
INTEREST in military procurement is higher now than when Japan struck Pearl Harbor, at least among Chicago firms. Evidence of this interest has been the unexpectedly large response to an offer by the Chicago Association of Commerce & Industry of a new "Directory of Federal Government Purchasing Offices." By three days after the association said it would supply Chicago firms with the directory it had received more than 850 requests. Manufacturing companies, particularly those in the metals field, were the most interested.

Compilation of the directory was begun by the association two months ago because of a mounting number of inquiries on the proper procedure for obtaining government orders.

Another First for Great Lakes Steel

Cold-Stamped Bumpers OF High-Tensile Low-Alloy Steel





Over eight years ago the Great Lakes Steel Corporation applied N-A-X HIGH-TENSILE STEEL to the first cold-stamped automobile bumper. This represented the first practical application of high-tensile, low-alloy steel to the passenger car industry.

Today, passenger car manufacturers have universally recognized the superiority of cold-stamped bumpers which utilize the high strength, good formability, and better surface texture of high-tensile steel. Four out of five cars built today have them as original equipment – concrete evidence of the economic value of this Great Lakes Steel contribution to the automotive industry.

MAKE A TON OF SHEET STEEL GO FARTHER
Specify–
N·A·X
HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION
N-A-X Alloy Division • Detroit 18, Michigan
UNIT OF NATIONAL STEEL CORPORATION

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Increasing concern expressed by automakers planning new models as tool and die workers halt work on 1949 tooling programs

DETROIT

AS THE STRIKE of 5000 UAW employees in 75 Detroit-area tool and die shops dragged into its fourth week, increasing concern was being expressed by auto manufacturers whose 1949 tooling programs have been halted since June 17. These shops constitute a core of about the most expert, and at the same time the most expensive, talent in the field of tool and die making. Nearly all car builders are dependent upon them in varying degree. Larger companies like General Motors and Ford operate their own "captive" die shops but still place a considerable volume of work on the outside. Much of the forthcoming Chrysler program was awarded to Budd in Philadelphia, although local die shops also were participating.

Average hourly rate for all employees, from sweeper to die leader, in the independent shops was $1.99 per hour. Average rate for skilled labor is $2.10. Negotiations on a new contract had simmered down to a demand from the UAW for a 15-cent increase and an offer by employers of 11 cents. Ten days ago, employers boosted their offer to 13 cents which led to reports the strike had been settled. The union, however, rejected the new offer and early last week the situation was a complete impasse and no further conferences were scheduled.

Management Resists Demands — The die shop managements are showing an understandable resistance to sharp wage boosts. Their rates already are 25 cents an hour beyond what the captive shops pay for skilled help, and the 13-cent pattern has been accepted by many units of the parts industry. Meanwhile, the union has gone around to the back door, so to speak, of at least two members of the multiple-employers' group and hammered through settlements on the basis of 15 cents increase with the understanding that anything beyond this figure granted by the group would be met retroactively. Furthermore, approximately 20 tool and die companies, not members of the local association, have given similar increases. Their story is that they want to finish business now on the books and then close up shop for good. That is how smelly they think the outlook is.

May File Charges—Faced with this type of double dealing on the part of the union, the association planned last week to file unfair labor practice charges against the union for not bargaining in good faith. The union's strategy was clear—if a 15-cent increase could be wrung out of a couple of small shops, then the rest might be bludgeoned into following along. However, members of the association were bitter over this kind of chicanery and were determined to hold the line even more firmly than before.

Average weekly earnings of employees in local tool and die shops for the first quarter, including a generous amount of overtime, figured to $103. Thus, they already have lost over $400 income in a squabble over 2 cents an hour. That means it would take 20,000 hours at the higher rate, if they succeed in getting it, to recoup income already lost, or the equivalent of something over seven years of steady work. Obviously the loss never will be restored.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1948	1947
January	422,324	366,205
February	399,460	393,636
March	519,126	443,588
April	462,295	445,137
May	359,987	404,191
June	460,615*	421,466
6 mos.	2,623,807	2,474,223
July		400,944
August		364,478
September		444,501
October		461,536
November		417,493
December		492,109
12 mos.		5,055,284

* Preliminary.

Estimates for week ended:

	1948	1947
June 19	109,259	102,545
June 26	95,027	102,203
July 3	112,349	63,460
July 10	85,000	90,075

Estimates by Ward's Automotive Reports

Ford Offers Meteor in Canada

REALIGNMENT of Canadian-built Ford passenger cars neared completion last week with public announcement in the Dominion of the Meteor model. Prior to the war, Canadian dealers handled all three of the Ford units—Lincoln, Mercury and Ford. In 1945 they were split into two groups, in conformance with the policy established in this country. One handled Ford only, the other Lincoln and Mercury. To give Ford dealers a car in a somewhat higher price and weight bracket, the Monarch was introduced — essentially the present 1949 Mercury body and engine with a little different grille treatment. L-M dealers had been selling the so-called Mercury 114, a lower priced version of the Mercury, along with the Lincoln. When import restrictions virtually prevented bringing in Lincoln models from the U. S., these dealers needed something new to round out their line, so the Meteor was conceived to replace the Mercury 114. The Meteor has the Ford body shell and 100-horsepower V-8 Ford engine but with a distinguishing radiator grille virtually duplicating the present Mercury. It is of course exclusive with Canada and will be available in the same number of models that the Ford offers in this country.

Circular Conveyor

MERRY-GO-ROUND conveyor installations are common in most motor car plants these days for various types of subassemblies. They made their first general appearance for assembly of front-end components — fenders, radiator, lights, etc.—some years ago. Recently a new 180-foot conveyor of this type was installed in the Rouge plant of Ford Motor, replacing a smaller assembly circle previously used for front-end assemblies.

It is located alongside the final assembly line and has 18 platforms traveling around a circular track in a clockwise direction. At the start of the line, left and right aprons, coming from a side assembly table, are transferred to the merry-go-round. First operation is the installation of a gravel deflector, then right and

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NEW LOW-PRICED ENTRY: Aeronautical engineers designed this car in the $500-$750 price class for Airway Motors Inc., San Diego, Calif. Distribution organization is in process of being established throughout the country. Weighing only 600 pounds, production versions will have bodies of plastic and aluminum. Vehicle features fluid coupling instead of clutch and a rear-mounted, air-cooled engine of 10 hp

left fenders, outer grille molding and hood locking assembly, center grille bar and parking lights, headlights and fender emblems. Lights and horns are wired up and the radiator and top radiator shield are set in position.

When the completed assembly nears its final station, a limit switch automatically stops the entire conveyor. After a hoist removes the completed unit to the final line, the switch kicks back and the circular line resumes motion. If necessary, direction of the line can be reversed through the electric motor drive below the floor level.

Machinery Sellers Hopeful

MACHINERY and equipment interests, currently in a slow period as far as new orders are concerned, see a number of hopeful prospects on the horizon. First, of course, is the new high-compression engine division being set up by Oldsmobile to build a V-8 Kettering-type engine and with production scheduled some time next year. The engine is entirely different from anything Olds has been building and should require extensive new machine tool installations, forging dies, foundry patterns and flasks and the like. Foundry work has been transferred from Pontiac to Chevrolet Gray Iron at Saginaw. It is considered a possibility that Olds may introduce the engine first on its top-price line only—the 98 or Futuramic series. Probably another year would be required to build up sufficient production to equip the two smaller Olds.

Buick is known to have been testing a similar type of engine and could be preparing plans for its production, now that Olds has made the move. General Motors Divisions are still competitive with one another, despite the fact they come under unified overall supervision at the policy level. Buick also will require additional equipment to extend its production of Dynaflow transmissions.

Packard's automatic transmission division, now a reality, should be out with a list of equipment needs before long and it should run to a fairly large sum, since these transmission units are complicated and involve a large number of parts, all of which must be held to precise limits.

Chevrolet has been putting an automatic transmission unit of the torque converter type through its paces and some observers would have you believe it will be ready for production in 1949, in the effort to steal a march on Ford. Latest word from the latter is that an automatic transmission, when ready, will be offered first by Lincoln, then Mercury and finally Ford.

Beyond the requirements for these special devices, there is a constant search and review of all manufacturing operations in the quest for cost reduction and this usually takes the form of further mechanization, further conveyorization and further automaticity, to reduce the man-hour load. It is hard to see how equipment builders can be pessimistic in their outlook and doubtless the occasional depressed views now being heard are nothing more than seasonal. The motor companies have the money to spend and, as their break-even points have mounted steadily higher over the past three years, they have good reason to spend it. All they need is to be shown where and how.

Packard Sets Records

JUNE saw three new postwar automobile production and shipment records at Packard. Assemblies mounted to 10,126, against a previous peak of 9269 in April. Shipments totalled 10,060 compared with a previous high of 9232. A new daily high of 613 was registered on June 29. Output for the first half of the year, at 46,200, compares with 55,477 turned out in all of last year and was realized despite loss of 17 working days in the period—14 due to gas shortage and three due to work stoppages. Labor dispute at the plant of a brake supplier forced suspension of operations over last week's holiday but a flying start was scheduled for Wednesday.

K-F Raises Prices

KAISER-FRAZER has bowed to the inevitable and raised prices 4.7 per cent on all models except the Kaiser custom. The move surprised many who held to the view that K-F prices had been set at the so-called "gray market" level and therefore permitted a better margin of profit than that enjoyed by competitive producers. In support of this a recent survey engineered by the *Wall Street Journal* showed Kaiser-Frazer 1948 models the only ones to be selling at a discount from factory list prices on used car lots throughout the country. Other makes were bringing premiums from 10 to 60 per cent over factory list.

GM Lifts Replacement Parts

GENERAL MOTORS Divisions are managing to hold off against the rising price trend, although recent upward adjustments were made in replacement parts, average increase approximating 5.9 per cent. Even with these increases, however, the overall increase in retail parts prices since the fall of 1940 amounts to only about 46 per cent, contrasted with an increase of 70 per cent in the consumer price index for the same period. Imminent increase in basic steel prices, however, makes it extremely doubtful that GM can defer much longer higher price tags on passenger cars; trucks already have been boosted.

Lower cost per thread
WITH IMPROVED RADIAL CHASER DIE HEADS

THESE MURCHEY STANDARD DIE HEADS CUT THREADS IN SIZES FROM NO. 6 TO 6" IN DIAMETER

Larger sizes are available. Both are equipped with quick change chasers and snap action trip.

The "ORB" is used on automatic screw machines, drill presses or other machines which rotate the tool.

The "OLB" is a pull-off type self-opening unit for use on turret lathes, hand screw machines or other machines on which the tool remains stationary. It is ideal for short length threads or threading close to a shoulder because of a new trip adjustment. Size adjustment is controlled by a single nut at the forward end of the shank.

2934

The ease of handling

These tools and their simplicity of operation assure perfect threads at lowest cost. Ask for a demonstration in your own plant.

Lowest cost per thread . . .

MURCHEY MACHINE & TOOL CO.

MURCHEY

SUBSIDIARY OF THE SHEFFIELD CORP.
DAYTON 1, OHIO, U. S. A.

Manufacturers of collapsible taps, self-opening die heads (tangent and radial chaser types) and special threading tools

Perfection Stove Expands

Firm is remodeling and expanding Cleveland plant for manufacture of gas ranges

ALTHOUGH the metalworking industry generally is struggling to meet customer requirements, Perfection Stove Co. has been grappling with the fact that eventually it would require customers—for its oil stoves. To meet the situation, the company is remodeling and expanding its Ivanhoe Road plant in Cleveland for production of gas ranges, as well as its existing kerosene models.

The $6 million construction program will give the plant approximately 18 acres of floor area, housed upon 29.46 acres of land. With work to be completed by the end of the year, the project involves expansion of its assembly plant and building a boiler house and press unit, part of the latter being shown at the right. Plant will ultimately give employment to 2500. The new press building is a structure 855 ft by 110 ft, equipped with a 20-ton traveling crane. Already completed are five press pits in the building, planned to facilitate future moving of presses to meet changing production procedures. Power for the new plant will be supplied by two transformer stations, each containing three 1000 kva transformers. In addition, there there will be two 1000 kva transformers for welding use.

The entire plant, including the remodelled portions, will be conveyorized. First of the new buildings to be completed is the boiler house. Three 600 hp boilers have been installed to provide steam for both heating and manufacturing.

PRESS BUILDING RISES AT PERFECTION STOVE'S EXPANDED PLANT

Bethlehem Joins in Atom Research

ONE route which may lead industry to more active participation in pure research was cleared a little further last week when Bethlehem Steel Corp. became the thirteenth of a group of industrial organizations supporting an industry-education research program being carried on in Chicago University's Institute of Metals, Institute of Nuclear Studies and Institute of Radiobiology and Biophysics.

Bethlehem, which contributed $100,000, will take part as a member of the program in quarterly scientific conferences at the university to discuss current progress and techniques. Members also receive advance reports—three to six months before general publication — on all phases of research. Members utilize any industrial application which may develop from contact with the university's atomic scientists and metallurgists as no developments will be patented except where such action may be necessary to protect against misuse.

Other members include: Westinghouse Electric Corp., U. S. Steel Corp., Standard Oil Co. of Indiana, Aluminum Co. of America, Beech-Nut Packing Co., Standard Oil Development Co. of New Jersey, Pittsburgh Plate Glass Co., Shell Oil Co., Inland Steel Co., Sun Oil Co., Celanese Corp. of America and Commonwealth Edison Group.

Armco Revises Suggestion Plan

EMPLOYEE suggestion system—used by many metalworking companies in labor-management relations—has come up for an overhauling by Armco Steel Corp., Middletown, O.

A new plan at Armco places all its plants under a single system, provides more liberal cash awards and speedier payment to stimulate money-saving ideas by employees. One purpose of the program, according to Charles R. Hook, chairman, is not only to reward financially but "to recognize thinking men and women." Financial awards will be based on a percentage of gross savings realized by the company from the adoption of a suggestion.

J & L Sells Indiana Tract

EXORBITANT cost of building entirely new steel plants has led Jones & Laughlin Steel Corp. to sell a 960-acre tract in Hammond, Ind., to Standard Oil Co. of Indiana. J & L is pursuing a policy of expanding its present facilities as a more economical project and has already appropriated $117 million as the first step in a major improvement and expansion program at other locations. Work began in 1946 and will not be entirely completed until 1950.

Standard said it acquired the property for future expansion but that no specific plans have yet been developed for its ultimate use.

Tube Turns Buys Forging Firm

TUBE Turns Inc., Louisville, Ky., has acquired one of its principal suppliers, Pennsylvania Forge Corp., Philadelphia. For several years Pennsylvania has been furnishing Tube Turns with flanges in all sizes.

George O. Boomer, president of the Kentucky firm, will be chairman of the board of Pennsylvania. James S. Kerwin, president, and W. T. J. Huggard, secretary and treasurer, and other officers will continue in their present capacities. There will be no change in the personnel of the various departments, and the business of the new subsidiary will be operated under its old name.

Central Steel Buys New Mills

CENTRAL Iron & Steel Co., Harrisburg, Pa., subsidiary of Barium Steel Corp., New York, has purchased a 2-high blooming mill, understood to have been originally scheduled for Brazil, from Frank B. Foster Co., Pittsburgh, and a 3-high universal plate mill from Tennessee Coal, Iron & Railroad Co., Birmingham. Installation of the blooming mill will not be completed for a number of months, and shipment of the plate mill to Harrisburg will not be started until after the turn of the year.

Briefs . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Porcelain Enamel Institute, Washington, reports that dollar value of a selected list of porcelain enamel products shipped during March, 1948, increased about 12 per cent, or $534,000 over the $4,500,000 value reported for February, 1948. The figure for March also represents an increase of 19 per cent over the shipments for March, 1947, and 116 per cent over the figure reported for March, 1946.

—o—

American Roller Die Corp., Cleveland, manufacturer of forming rolls and special machinery, has acquired patents and sales rights formerly held by McKinney Tool & Mfg. Co., Cleveland, manufacturer of roll forming machines, automatic cut offs and related devices. American will produce the entire McKinney line at its own facilities.

—o—

Edward Valves Inc., East Chicago, Ind., subsidiary of Rockwell Mfg. Co., has broken ground for new metallurgical, physical and chemical laboratories for research and development work on Edward and Nordstrom steel valves.

—o—

Fractional Motors Inc., recently formed to manufacture small electric motors, has established offices at 1900 Euclid Ave., Cleveland. Plant is being set up at Beloit, O.

—o—

Meehanite Metal Corp., New Rochelle, N. Y., has closed two contracts for the manufacture of Meehanite castings with Pesce & Simeone S.A., Montevideo, Uruguay, and Metallurgica Wallig S.A., Porto Alegre, Brazil. Both firms will utilize the castings in various products which they make.

—o—

Thompson Vita-Meter Corp., Cleveland, a subsidiary of Thompson Products Inc., is starting production of a device to inject water, alcohol and lead into gasoline engines when extra power is needed. Minimum production of 5000 per day is planned.

—o—

Bendix Home Appliances Inc., South Bend, Indiana, has appointed three Canadian distributors: Industrial Distributors Co. Inc., Montreal, for Quebec; Reliance Distributors Ltd., Toronto, for Ontario, British Columbia, Alberta, Manitoba and Saskatchewan; and Campbell Sales Agency Ltd., St. John, for New Brunswick, Nova Scotia and Prince Edward Island.

—o—

Avco Mfg. Corp., now in Detroit, will move its general operating offices to Cincinnati this month. Firm's production units are located in Cincinnati, Coldwater and Circleville, O., Carrollton, Ky., Richmond and Connersville, Ind., and Sandwich, Ill. Avco manufactures home appliances, farm implements and many other products.

—o—

Big Three Welding Equipment Co., Houston and Ft. Worth, Tex., distributing firm for Lincoln Electric Co., Cleveland, has opened a branch at Lubbock, Tex. L. A. Carter is in charge.

—o—

Hewitt Rubber Division, Hewitt-Robins Inc., Buffalo, has appointed F. L. Murdock & Co., Tulsa, Okla., as industrial and oil field distributor for hose, conveyor and transmission belting and packing.

—o—

General Steel Castings Corp. has moved its general offices from Eddystone, Pa., to Granite City, Ill. Headquarters for the treasury and purchasing departments will remain in Eddystone.

—o—

Carnegie-Illinois Steel Corp., Pittsburgh, U. S. Steel Corp. subsidiary, has licensed Greer Steel Co., Dover, O., to manufacture "Cor-ten," corrosion-resisting, low-alloy steel. Greer is the eighth firm to be licensed.

—o—

White Metal Mfg. Co., Hoboken, N. J., manufacturer of metal can spouts and collapsible tubes for industrial and other products, has appointed Clifford L. Iorns Co., St. Louis, as its representative in Missouri, southern Illinois and western Tennessee.

—o—

Parker Appliance Co., Cleveland, manufacturer of fittings, valves and hydraulic accessories, expects a resurgence of its aircraft business because of the recently authorized 70-group air force program.

—o—

United States Testing Co., Hoboken, N. J., has entered the field of supersonic research and has taken over activities in that area formerly pursued by Crystal Research Laboratories, Hartford, Conn.

—o—

Chemical Pump & Equipment Corp. has been newly formed at 75 West St., New York, to represent manufacturers specializing in chemical processing equipment. Firm will cover eastern New York and western Connecticut.

—o—

General Electric Co., Schenectady, N. Y., had a total of 249,457 stockholders as of June 18. More than 35 per cent of the stockholders own from one to 10 shares.

—o—

Naval Research Laboratory, Washington, celebrated the 25th anniversary of its establishment on July 2.

—o—

Chicago Association of Commerce and Industry reports industrial expansions and improvements in the Chicago area during June totaled $9,683,000, as compared with $7,762,000 in May and $15,630,000 for June, 1947. First half total was $63,184,000 in 1948, against $89,552,000 for the corresponding period of last year.

—o—

Republic Steel Corp., Cleveland, reports that the first pipe from its Gadsden, Ala., large diameter pipe mill recently was shipped, consigned to Southern Natural Gas Co., Birmingham.

—o—

Automatic Transportation Co., Chicago, manufacturer of materials handling equipment, reports that its French affiliate, Automatic S.A.R.L., has begun production in Paris for nine European and North African countries.

—o—

Defiance Machine Works Inc., Defiance, O., manufacturer of presses, has named Modern Tool Works Ltd., Toronto, Ont., as its Canadian distributor.

—o—

Bundy Tubing Co., Detroit, manufacturer of steel tubing, has named Austin-Hastings Co. Inc., Cambridge, Mass., as its distributor in New England and A. B. Murray Co. Inc., Elizabeth, N. J., as its agent south and west of New York City.

—o—

Island Equipment Corp., manufacturer of conveyors and related equipment, has moved its office and factory to 27-01 Bridge Plaza North, Long Island City, N. Y.

—o—

Atomic Energy Commission has published in the Federal Register proposed regulations governing procedure on applications for the determination of just compensation, a reasonable royalty fee or the grant of an award under the Patents & Inventions Section of the Atomic Energy Act.

The Business Trend

INTERRUPTION to industrial activity which the extended Fourth of July holiday weekend brought was not discernible in individual indicators during the week ended July 3. STEEL's index of industrial production held steady at 165 per cent (preliminary) of the 1936-1939 weekly average.

Foreseen for the remainder of the year are production increases in many fields and return of buyers' markets as pipelines fill. Competition for sales is on the increase, but competition for raw materials also is intensified.

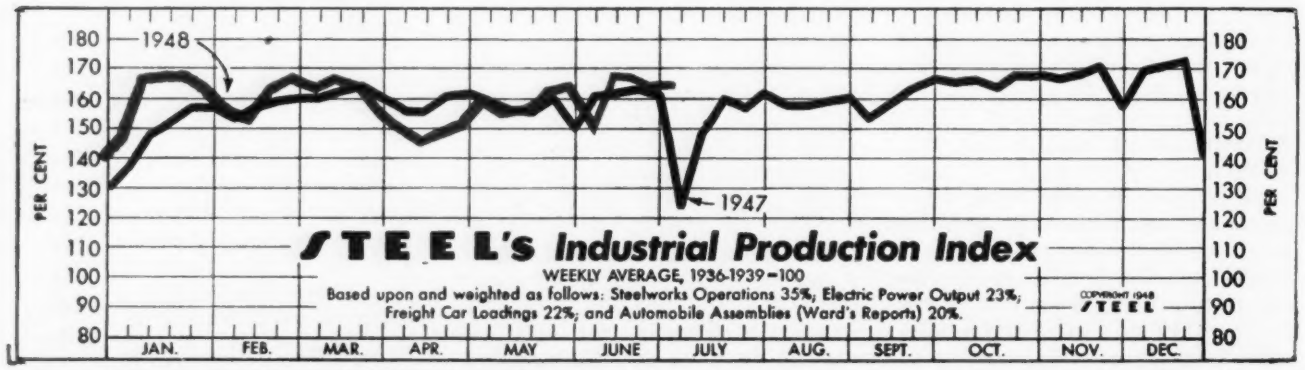
PRODUCTION—Trend of production improvement begun in May was confirmed in June by the National Association of Purchasing Agents. Twenty-eight per cent of the firms reporting to its survey showed increases, while the lowest number since last January reported declines. General business conditions, the purchasing men say, reflect the confidence instilled by prompt settlement of most wage controversies and the brighter political atmosphere. Better supply of bearings, steel balls, electrical supplies and fasteners is noted by buyers, although still hard to get are aluminum, ammonia, brass fittings, cadmium, chrome, coal tar products, coke, copper, ferroalloys, fuel oil, glue, iron, lead, methanol, nails, nickel, nylon, paper, phenol, pipe and fittings, steel, tin and zinc.

CARLOADINGS—A 3.7 per cent gain in freight carloadings over the third quarter of last year is expected by the 13 Shippers Advisory Boards of the Association of American Railroads. Largest gains over last year are anticipated in automobiles and trucks and parts, machinery and boilers, construction materials, coal and coke, iron and steel, agricultural needs, and chemicals.

PRICES—Imminence of changes in prices throughout the steel industry attest to the pervasiveness of the economy's creeping inflation. Hope for cost stabilization within the industry now has disappeared and in its place is the desire to keep new increases from fanning a smouldering inflation fire into a holocaust. Wholesale prices, as measured by the Bureau of Labor Statistics index, rose to a new postwar peak in the week ended June 26.

SALES—Durable goods manufacturers accounted for $6.5 billion of manufacturers' aggregate sales in May of $16.5 billion, the hard-goods industries showing an average daily drop of less than 1 per cent from the previous month. Increase in sales by the nonferrous metals and the machinery (except electrical) industries partially offset seasonal declines in heating apparatus sales and in sales of other fabricated products of the iron and steel group and the electrical machinery industry.

ENTERPRISE—Upward trend in business failures which began in 1946 continued in May, 426 firms slipping from the economic scene as compared with 404 in April and 378 in May, 1947. Volume of new businesses incorporated in the month, at 8246, was lower than in April and fell below the corresponding 1947 period for the fifth consecutive month.



Index (chart above): Week ended July 3 (preliminary) 165 Previous Week 165 Month Ago 153 Year Ago 124

BAROMETERS of BUSINESS

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	95.0	96.0	95.5	73.0
Electric Power Distributed (million kilowatt hours)	5,166	5,257	4,845	4,190
Bituminous Coal Production (daily av.—1000 tons)	2,128	2,235	2,302	1,355
Petroleum Production (daily av.—1000 bbl.)	5,484	5,494	5,476	5,065
Construction Volume (ENR—Unit $1,000,000)	$160.9	$160.2	$135.0	$105.6
Automobile and Truck Output (Ward's—number units)	112,349	95,027	75,607	63,460

* Dates on request. † 1948 weekly capacity is 1,802,476 net tons. 1947 weekly capacity was 1,749,928 net tons.

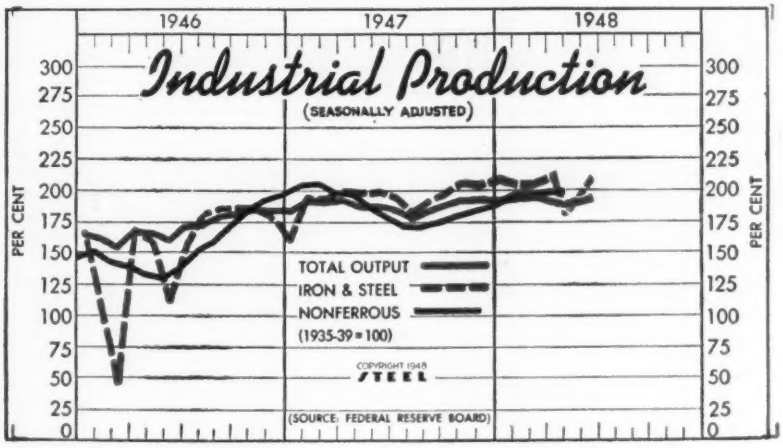
TRADE				
Freight Carloadings (unit—1000 cars)	750†	889	821	629
Business Failures (Dun & Bradstreet, number)	105†	111	91	82
Money in Circulation (in millions of dollars)‡	$27,900	$27,792	$27,895	$28,409
Department Store Sales (change from like wk. a yr. ago)‡	+7%	+21%	+19%	+8%

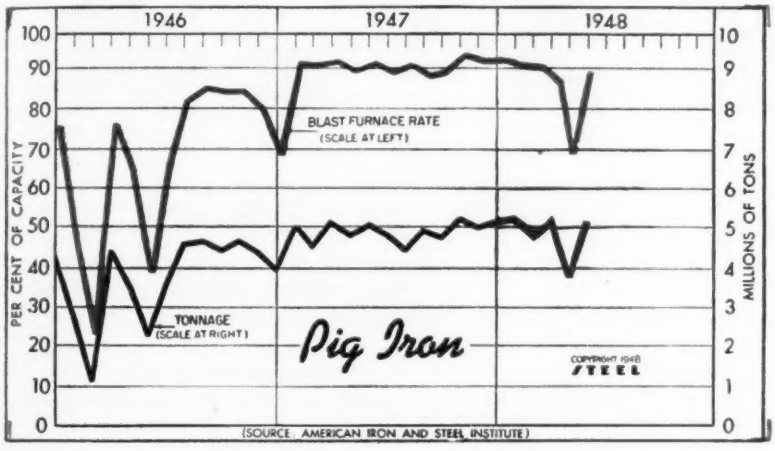
† Preliminary. ‡ Federal Reserve Board.

Federal Reserve Board's Production Indexes

(1935-39=100)

	Total Production		Iron, Steel		Nonferrous	
	1948	1947	1948	1947	1948	1947
Jan.	193	189	203	192	197	203
Feb.	194	189	203	191	197	208
Mar.	192	190	207	196	200	202
Apr.	188	187	177	195	198	197
May	192	185	206	197	...	187
June	...	184	...	193	...	179
July	...	177	...	181	...	172
Aug.	...	182	...	188	...	171
Sept.	...	186	...	195	...	174
Oct.	...	190	...	204	...	179
Nov.	...	192	...	202	...	185
Dec.	...	192	...	205	...	189
Ave.	...	187	...	195	...	186





Pig Iron*

	Production (Net Tons—000)			Operating Rate (% of capacity)		
	1948	1947	1946	1948	1947	1946
Jan.	5,194	5,071	2,644	90.9	90.8	47.4
Feb.	4,838	4,550	1,148	90.6	90.3	22.2
Mar.	5,020	5,123	4,424	87.8	91.8	77.3
Apr.	3,840	4,830	3,614	69.4	89.3	65.2
May	5,077	5,081	2,274	88.8	91.0	39.8
June	....	4,810	3,682	...	89.0	66.5
July	....	4,585	4,705	...	90.3	82.4
Aug.	....	4,916	4,898	...	88.1	85.6
Sept.	....	4,801	4,687	...	89.0	84.8
Oct.	....	5,228	4,814	...	93.6	84.1
Nov.	....	5,015	4,435	...	92.8	80.0
Dec.	....	5,177	3,992	...	92.9	69.9
Total	....	59,210	45,318	Ave...	90.1	67.4

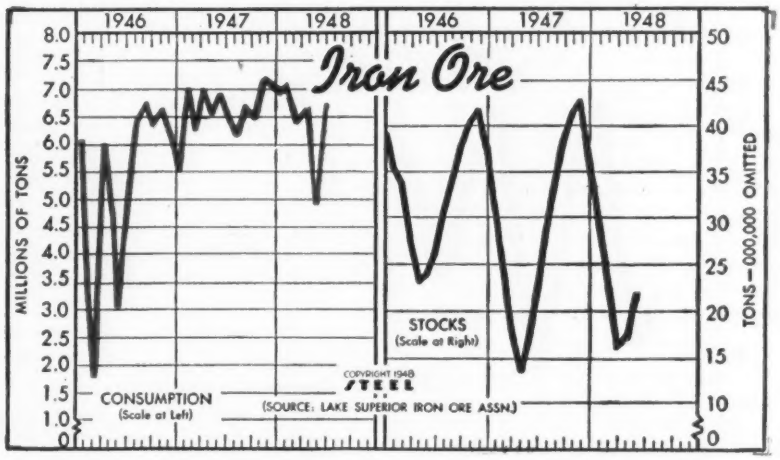
* Includes ferromanganese and spiegeleisen.

Iron Ore

(Lake Superior Iron Ore Assn.)

Gross tons—000 omitted

	Consumption		Stocks at Lake Erie Docks and Furnaces	
	1948	1947	1948	1947
Jan.	7,057	7,024	29,081	30,514
Feb.	6,440	6,264	22,628	24,317
Mar.	6,634	6,979	16,022	17,411
Apr.	4,976	6,579	17,125	13,555
May	6,656	6,885	22,058	17,618
June	....	6,500	.....	21,746
July	....	6,156	.....	28,440
Aug.	....	6,638	.....	33,896
Sept.	....	6,492	.....	38,370
Oct.	....	7,151	.....	41,641
Nov.	....	7,068	.....	43,010
Dec.	....	6,970	.....	36,095
Total	....	80,807		



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$14,065	$15,135	$11,752	$13,936
Federal Gross Debt (billions)	$252.4	$251.7	$251.9	$258.4
Bond Volume, NYSE (millions)	$18.8	$24.1	$15.3	$17.2
Stocks Sales, NYSE (thousands)	4,764	7,631	5,003	4,191
Loans and Investments (billions)†	$62.9	$63.1	$63.1	$63.3
United States Gov't. Obligations Held (millions)†	$34,869	$35,250	$35,237	$38,943

† Member banks, Federal Reserve System.

PRICES

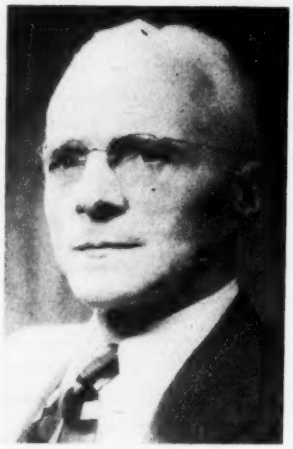
STEEL's composite finished steel price average	$80.27	$80.27	$80.27	$69.82
All Commodities†	166.7	165.3	164.4	147.6
Industrial Raw Materials†	185.2	182.7	180.8	161.6
Manufactured Products†	160.5	159.5	159.1	142.7

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

B. E. BASSETT

J. N. CANDLER



J. H. LAMMERT

Inaugurating a decentralized products management form of organization, Olin Industries Inc., East Alton, Ill., has announced several appointments. Made necessary by the company's growth and diversity of products, the new form of organization sets up two regional managers who have charge of all manufacturing operations at the company's Western Cartridge Co. Division at East Alton, and Winchester Repeating Arms Co. Division at New Haven, Conn.

Regional manager for the East Alton operations is **B. E. Bassett** of Alton, Ill., who also will co-ordinate production and manufacturing methods at East Alton and New Haven. Mr. Bassett, who is a director of Olin Industries Inc., formerly was general manager of the United States Cartridge Co., an Olin subsidiary. Regional manager for the New Haven plant is **George L. Dawson,** previously of St. Louis.

Through other Olin appointments **Fred Olsen** of Alton, company director and head of research and development of Western Cartridge, becomes director of research for Olin Industries to co-ordinate all research activities, including those for the explosives divisions; and **J. J. Sharkey** of Alton, veteran purchasing agent for Western Cartridge, becomes director of purchases to co-ordinate purchasing activities at all Olin plants.

—o—

A. W. Wood has been appointed field engineer at the Detroit district office, Elliott Co., Jeannette, Pa., and **L. B. Rahn,** as field engineer at the New York district office. Mr. Wood recently served as a senior marine engineer in the U. S. Maritime Commission, and Mr. Rahn was associated with Bucyrus-Erie Co.

—o—

J. N. Candler, affiliated with Norge and Detroit Gear Divisions, Borg-Warner Corp., Detroit, in various engineering and manufacturing capacities since 1940, has been appointed director of manufacturing for Norge. **H. L. Clary** has been named director of sales, and **W. S. Law,** general sales manager. Meanwhile, **R. W. Gifford,** Norge vice president and assistant general manager, has resigned, although continuing as chairman of Borg-Warner International Corp. **I. H. Reindel,** executive engineer with Norge and Detroit Gear Divisions since 1925, also has resigned, and **M. G. O'Harra,** vice president and director of sales, has retired.

—o—

C. B. Murphy has been appointed by Lima-Hamilton Corp., Lima, O., to represent the firm in the sale of diesel engines and power engineering equipment in the Southwest. He will have headquarters at Dallas.

—o—

W. G. Hancock, formerly vice president in charge of operations, has been elected president of McCord Corp., Detroit. He succeeds **A. C. McCord,** who has been chairman and president, and who will continue as chairman and principal executive officer of the company.

—o—

Loftus Engineering Corp., Pittsburgh, announces the appointment of **John B. Carlock** as chief consulting engineer. Mr. Carlock has retired from the active steel production field as chief engineer of plants for Jones & Laughlin Steel Corp. His activities with the Loftus Engineering Corp. will be devoted to the design and construction of industrial plants and their related facilities for the iron and steel industry.

—o—

J. H. Lammert has been elected vice president, Oliver Iron & Steel Corp., Pittsburgh. In this capacity Mr. Lammert will assume new executive duties, and, in addition, will continue to serve as general purchasing agent, a position he has occupied since 1935. He has been associated with the corporation since 1905.

—o—

Hyman-Michaels Co., St. Louis, announces that **Erwin W. Wolf** has become associated with the St. Louis office. Mr. Wolf's duties will include the purchase of scrap iron. For the past eight years, he has been connected with the Commercial Metals Co., Dallas, Tex.

—o—

Radcliffe L. Romeyn has been appointed vice president and factory export manager, International Division, Philco Corp., Philadelphia. For the past two years, Mr. Romeyn has served as factory export manager of Philco Corp. He will continue the same duties with added responsibilities in his new position.

—o—

Walter Morrison, public relations and advertising consultant, writer and radio executive, has been appointed director of public relations for the American Society for Metals, Cleveland, succeeding **Graves Taylor.**

—o—

Albert R. Cranks has been appointed district representative for the territory of western Pennsylvania, New

Both are Big News...

FORD ANNOUNCES 1949 MODELS
FORD TO SAVE $11,643.98 PER SPEED NUT SPECIFIED!
Ford Purchasing Department Estimates That Every SPEED NUT Used On 1949 Model Saves $11,643.98 Per Million Cars Produced
Comparison of Costs of Present Fastenings and Speed Nuts Per 1,000,000 Cars—8 Applications

SPEED NUTS* are playing an important part in the production of the 1949 Ford. They are effecting substantial savings and speeding up hundreds of assembly operations. Every one of the over 200 SPEED NUTS specified for the 1949 models was selected because it could do the job better . . . and save money, too.

SPEED NUTS have produced similar savings for thousands of manufacturers in the automotive, aircraft, appliance and other industries. Interested in reducing your assembly costs? Let Tinnerman engineers make a thorough Fastening Analysis of your products. Write today for detailed information. TINNERMAN PRODUCTS, INC., 2038 Fulton Road, Cleveland 13, Ohio.

In Canada: Dominion Fasteners Limited, Hamilton • *In England:* Simmonds Aerocessories, Ltd., Treforest • *In France:* Aerocessoires Simmonds, S.A., Paris

TINNERMAN *Speed Nuts*®

®Trade Mark Reg. U. S. Pat. Off.

FASTEST THING IN FASTENINGS — MORE THAN 4000 SHAPES AND SIZES

Jersey, Delaware, Maryland and District of Columbia for Threadwell Tap & Die Co., subsidiary, Sheffield Corp., Dayton, O. Mr. Cranks joined Threadwell after 16 years' experience in the tap and die industry, and will serve the Threadwell distributors in his area on their tapping problems.

—o—

The 1948 Daniel Guggenheim Medal, given for notable achievements in the advancement of aeronautics, has been awarded to **Leroy R. Grumman,** chairman of the board of Grumman Aircraft Engineering Corp., Bethpage, N. Y., for "outstanding achievement in successfully advancing aircraft design both for Naval and peacetime use." The selection of the recipient for this honor is made by a board of 21 members, consisting of the former recipients of the medal and representatives of the American Society of Mechanical Engineers, the Society of Automotive Engineers, the Institute of the Aeronautical Sciences and the United Engineering Trustees.

—o—

Donald M. Willard, associated with Lukens Steel Co. and divisions, By-Products Steel Co. and Lukenweld, Coatesville, Pa., for 22 years, has been appointed superintendent of the construction department of the company. He succeeds the late **William C. A. Busch. Roland R. Trask** has been appointed assistant superintendent of the construction department, and **Albert M. Kuhn,** assistant to the superintendent of that department, in charge of masonry. **F. H. Gordon** has retired as vice president of Lukens Steel Co., after 53 years' association.

—o—

John G. Seiler has been elected executive vice president of Tube Turns Inc., Louisville. Mr. Seiler became associated with Tube Turns in 1930, and a year later was appointed sales manager. He was made vice president at the beginning of World War II, and general sales manager in 1945.

—o—

Clarence E. Davies, national secretary, American Society of Mechanical Engineers, has been awarded the honorary degree of Doctor of Engineering by Clarkson College of Technology, Potsdam, N. Y.

—o—

Arthur W. Crossley, for the past three years assistant general manager, Potomac Electric Power Co., Washington, has been elected treasurer, Diamond Alkali Co., Cleveland. He succeeds **William H. Evans,** who, in addition to his duties as general manager of Diamond's six silicate-producing plants, has been acting treasurer since March.

—o—

Clifford G. Patch has been appointed manager of the Sunnyvale Works in California for Westinghouse Electric Corp.

—o—

Charles P. Roney Jr., controller, Steel Sales Corp., Chicago, has been elected to membership in the Controllers Institute of America.

—o—

John K. Killmer has been elected metallurgical engineer on the staff of the operating vice president of Bethlehem Steel Co., Bethlehem, Pa. He succeeds **Henry Wysor,** retired. Mr. Killmer has been with Bethlehem in various capacities since 1923. During the last war Mr. Killmer served in the Steel Division, War Production Board, for about three years as chief of the alloy steel branch and as assistant director of the division.

—o—

Robert A. Morris has been promoted to assistant to the president, Acme Steel Co., Chicago. Mr. Morris was formerly director of advertising-publicity. **F. R. Grove Jr.,** formerly assistant advertising manager, has been promoted to the position of advertising manager.

—o—

Harry C. Williams has been appointed general sales manager, H. K. Ferguson Co., industrial engineers of Cleveland, New York and Houston. Mr. Williams was formerly with General Electric Co., where he has been a division manager for eight years. He also was formerly vice president and general manager, Chemical & Dye Corp.

—o—

M. E. Nicklin, manager, Export Division, Oil Well Supply Co., U. S. Steel Corp. subsidiary, has been appointed sales manager for the company's Witte Engine Works Division at Kansas City. **M. E. Keenan,** assistant manager of the Export Division, with headquarters in New York, has been named to succeed Mr. Nicklin.

—o—

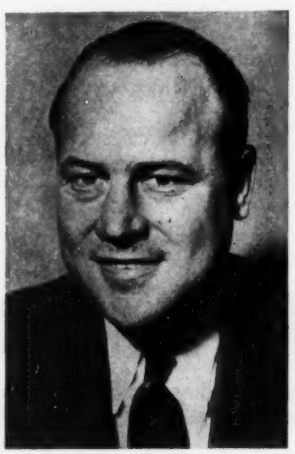
E. J. LeViseur has been appointed superintendent of maintenance, Pittsburgh Works, Jones & Laughlin Steel Corp., Pittsburgh. **C. J. Wyrough** will continue as assistant superintendent of that department, and **J. M. Morris** has been appointed general maintenance engineer at the Pittsburgh Works.

—o—

Sherman L. Crary has been appointed treasurer, Bethlehem Pacific Coast Steel Corp., San Francisco, succeeding **E. B. Hill,** retired. Mr. Crary has been assistant treasurer and secretary of the company. He will continue as secretary. Mr. Hill retires after 48 years of service with the Bethlehem organization. In 1930 he was named vice president and treasurer of Pacific Coast Steel Corp., a new Bethlehem Steel Corp. subsidiary, and at the same time, he retained his position as vice president

JOHN G. SEILER

JOHN K. KILLMER



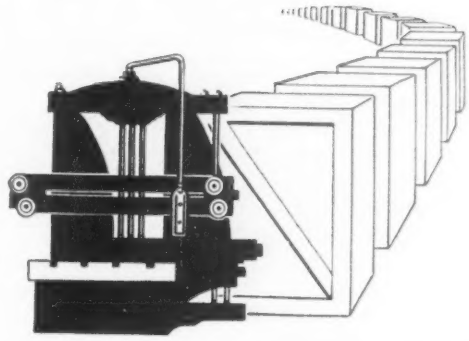
SHERMAN L. CRARY

SMOOTH OUT PRODUCTION "WRINKLES"...

An alert appliance manufacturer, whose output of electric irons was tied up by a knotty production problem involving handles, would find that OSTUCO Tubing provides the answer in a sturdy, lightweight handle, easily and quickly assembled to the iron. With OSTUCO doing the angle cutting, bending, drilling and threading, the manufacturer could trade a difficult production operation for a simple, low-cost assembly job.

INCREASE PRODUCTIVE OUTPUT...

A manufacturer of turret lathes could step up productive output by using OSTUCO Tubing for the collets and spindles of his product. With OSTUCO Tubing, fabricated to his specifications, there'd be no time lost on the production line . . . productive output would soar, production costs would drop.



WITH HAND-CRAFTED OSTUCO TUBING

Hand tools pose many difficult production problems, but more than one manufacturer knows it pays to have OSTUCO handle the details. In producing socket wrenches for example, time, labor and money can be saved with OSTUCO Tubing, and with OSTUCO craftsmen doing the tapering, flattening, shaping and bending necessary. Your production problems can be simplified—and your production costs lowered—with OSTUCO Tubing and OSTUCO experience and skill . . . why not ask the nearest sales office to show you how and why?

OSTUCO

THE OHIO SEAMLESS TUBE COMPANY

***Plant and General Offices:* SHELBY, OHIO**

SALES OFFICES: CHICAGO, Civic Opera Bldg., 20 North Wacker Dr. CLEVELAND, 1328 Citizens Bldg. • DAYTON, 1517 E. Third Street DETROIT, 2857 E. Grand Blvd. • HOUSTON, 927 A M & M Bldg. • LOS ANGELES, Suite 200-170 So. Beverly Drive, Beverly Hills • MOLINE, 225 Fifth Avenue Bldg. • NEW YORK, 70 East 45th St. • PHILADELPHIA, 1413 Packard Bldg., 15th & Chestnut • ST. LOUIS, 1230 North Main St. • SEATTLE, 3205 Smith Tower • SYRACUSE, 501 Roberts Ave. CANADIAN REPRESENTATIVE: Railway & Power Corp., Ltd., HAMILTON, MONTREAL, NORANDA, NORTH BAY, TORONTO, VANCOUVER and WINNIPEG

of the Bethlehem Shipbuilding Corp. In 1945 a new company—Bethlehem Pacific Coast Steel Co.—was formed, and Mr. Hill was made its vice president and treasurer, his position at retirement.

—o—

Charles F. Bannan has been elected president, California Metal Trades Association, succeeding to the post held by **Joseph Moore Jr.,** Moore Dry Dock Co., for the past year. Also elected were **Cloyd Gray,** president, W. R. Ames Co., San Francisco, as vice president of the association, and **Roy Tatam,** general manager, Western Piping & Engineering Co., as the new treasurer. Mr. Bannan, vice president, Pacific Gear & Tool Works, San Francisco, has been on the association's board of directors for two years, and prior to his connection with the California association, served two years as president, Washington Metal Trades Association.

—o—

Carl W. Volz has been elected a vice president of Electro Metallurgical Co., which is a unit of Union Carbide & Carbon Corp., New York. Mr. Volz has been with the organization since 1913, and is an officer and director of several other corporation subsidiaries.

—o—

Louis Reynolds, formerly assistant to **Ralph Heintz,** Jack & Heintz Precision Industries Inc., Cleveland, has been made vice president in charge of production, succeeding Mr. Heintz.

—o—

E. L. Behrends has joined the general sales department of Taylor Forge & Pipe Works, Chicago, which operates plants at Chicago and Carnegie, Pa. Mr. Behrends formerly was vice president of George B. Limbert Co., and later became manager, Western Supply Division, Lummus Co., operating the former Limbert facilities.

—o—

B. F. Goodrich Co., Akron, announces three new appointments in its advertising department: **George B. Koch** has been named advertising and sales promotion manager; **John F. Moriarty,** who formerly directed advertising production, will handle publicity; **John F. Amos** will do technical writing.

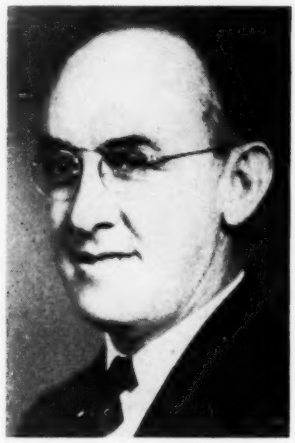
—o—

A. A. Derse, associated with Murray Corp. of America, Detroit, for the past 23 years, lately as manufacturing staff executive, has been appointed vice president of manufacturing.

—o—

Denny Bohn, conveying and materials handling engineer, has been

CHARLES O. BURGESS



WILLIAM J. THOMAS

placed in charge of same with Island Equipment Corp., Long Island City, N. Y., at the firm's recently opened branch office at 2205 Washington St., Newton Lower Falls, Mass. Mr. Bohn will be assisted by **John Durkee.**

—o—

Charles O. Burgess, for 25 years head of the steel and gray iron research laboratories of Union Carbide & Carbon Co., at Niagara Falls, N. Y., has been appointed technical director of Gray Iron Founders' Society Inc., Cleveland, where he will establish a technical department of the society, and initiate a long-range program of product improvement, technological development, handbook preparation and technical research in the interest of the members of the society and their customers.

—o—

Francis W. Sheppard, formerly general sales manager of Harbison-Walker Refractories Co., Pittsburgh, has been elected vice president in charge of sales of Woodward Iron Co., Woodward, Ala. He succeeds **John B. DeWolf,** recently retired. Mr. Sheppard will maintain offices in Birmingham.

—o—

Peter Robertson, works manager, Truscon Steel Co., at Youngstown, has been named assistant to the district manager of Republic Steel Corp., at Cleveland. Mr. Robertson is succeeded by **Douglas K. Forsyth,** assistant works manager, who is, in turn, succeeded by **John H. Hamill.**

—o—

Inland Steel Products Co., Milwaukee, announces the appointment of **Gordon W. Matthews** as jobber sales representative in the southeastern portion of the United States. His headquarters will be at Atlanta.

—o—

Charles R. Davis, vice president since 1939 of Birmingham Gas Co., has resigned that post to become gas engineer with the Ebasco Services Inc., New York.

—o—

William J. Thomas has been appointed general sales manager, Babcock & Wilcox Tube Co., subsidiary of Babcock & Wilcox Co., New York. Before joining the tube company, Mr. Thomas was associated with Petroleum Iron Works until 1932. For the following eight years, he was with Babcock & Wilcox Co., leaving his position as assistant manager, Process Equipment Division, in 1941 to join the tube company. Since 1942 he has been assistant general sales manager.

—o—

Harold S. Stickel has been appointed general manager of Dreyer Metal Products Co., Pittsburgh. **Willis L. Ross** has been named chief engineer. Mr. Stickel was formerly associated with Mesta Machine Co., and for the past two years was with Uhl Construction Co.

—o—

R. I. Parker has been elected a commercial vice president, General Electric Co., Schenectady, N. Y. He succeeds **W. O. Batchelder,** retiring after 43 years' service. **T. B. Ellis,** formerly district manager, Industrial Division, has been appointed central district manager, apparatus department, succeeding Mr. Parker.

—o—

George W. Schultz has been appointed superintendent of the Truck & Bus Chassis Division, Highland Park plant, Ford Motor Co., Detroit. He joins Ford from the Atlanta plant of Buick-Olds-Pontiac Division, General Motors Corp.

—o—

Davis R. Cox has been made superintendent, by-product coke department, Tennessee Coal, Iron & Rail-

road Co., Birmingham. He succeeds **John J. Phillips,** who has retired. **Oscar H. Wilson** has been made assistant superintendent of the by-product coke department, succeeding Mr. Cox, and **David P. McMillan,** superintendent of ovens and unloading station.

—o—

W. D. Reed has been elected president, Star Tubular Products Co., Chicago. Mr. Reed recently resigned as vice president, Sawhill Mfg. Co., Sharon, Pa., and prior to that time he was affiliated with Republic Steel Corp. in its Pipe Sales Division in Chicago, Cleveland and Youngstown. **Richard L. Kopp** has been elected secretary of Star Tubular Products Co. He also had been with the Pipe Sales Division of Republic, and recently resigned as assistant sales manager, Sawhill Mfg. Co.

—o—

Oliver Iron & Steel Corp., Pittsburgh announces the appointment of **Hugh A. Dewar** as district sales manager, Pole Line Hardware Sales Division, with headquarters in Los Angeles. He will succeed **John A. Duncan,** retired.

—o—

August C. Jacob, assistant superintendent of maintenance, Youngstown district, Youngstown Sheet & Tube Co., has retired after 46 years of service.

JAMES M. TODD

—o—

James M. Todd, consulting engineer, has been nominated for next president of the American Society of Mechanical Engineers. He is vice president and a member of the board, Jefferson Lake Sulphur Co., in charge of engineering, at New Orleans. Other officers nominated by the ASME are: Regional vice presidents, **Arthur Roberts Jr.,** Lynchburg Foundry Co., Lynchburg, Va.; **Forrest Nagler,** Allis-Chalmers Mfg. Co., Milwaukee; **Carl J. Eckhardt,** University of Texas, Austin; and **Albert R. Mumford,** Combustion Engineering Co., New York, renominated. Directors-at-large, **Jacob A. Keeth,** Kansas State Power & Light Co., Kansas City; and **Ralph A. Sherman,** Battelle Memorial Institute, Columbus, O.

—o—

Buchanan Steel Products Corp., Buchanan, Mich., announces the election of **Elmer W. Cress** as president of the company, to fill the vacancy caused by the death of **D. A. Donahue.** Mr. Cress has held the office of vice president and treasurer for the past eight years. **E. T. Ross,** assistant treasurer, has been elected treasurer to succeed Mr. Cress.

—o—

Joseph Stemo, one of the founders of Stanek Tool & Mfg. Co., Milwaukee, and vice president for 24 years, has resigned because of ill health. **Arthur J. Seeger** was re-elected president. **Jerome H. Stanek** has been named vice president. **Lillian H. Funk** was elected secretary, and **Carrie Stanek,** treasurer.

OBITUARIES . . .

William F. Hart, 65, associated with National Supply Co. since 1940, died unexpectedly July 1 in a Cleveland hotel. He served as assistant to the chief of the Industrial Division of the Pittsburgh Ordnance District in World War II. Mr. Hart was president of Verona Tool Works, Verona, Pa., from 1920 to 1927, when he resigned to become the first manager of tubular sales for Bethlehem Steel Co. He resigned this post in 1931 to do research work for Weirton Steel Co.

—o—

Frederick H. Loomis, 59, assistant general manager of sales for Republic Steel Corp., Cleveland, died July 1, following a long illness. He had been in continuous service with Republic Steel Corp. and its predecessors since 1916, with the exception of 18 months' service in the U.S.N.R.F.

—o—

William F. Tynes, 52, president, Hardie-Tynes Mfg. Co., Birmingham, died July 3. He began his industrial career with Westinghouse Machine Co., Pittsburgh. Mr. Tynes was elected president of the company upon the death of his father, W. D. Tynes.

—o—

A. J. Browning, 48, since 1946 a vice president in charge of purchasing for Ford Motor Co., Detroit, died July 2. Mr. Browning headed the War Department's purchasing unit during the second World War. Previous executive positions were held with Acme White Lead & Color Works, Los Angeles, Peninsular Paint & Varnish Co., Detroit, and Montgomery Ward & Co., Chicago. Two years before going to Washington, Mr. Browning was president, United Wall Paper Factories, Chicago.

—o—

Leslie W. Kerr, 58, foundry superintendent, Bagly & Sewall Co., died recently after a short illness. For 11 years he was employed by Central Foundry Co., Newark, N. J., serving as metallurgist and production manager for that company. He became assistant superintendent of the Bagley & Sewall foundry in 1943, and was named superintendent in 1947.

—o—

D. C. Oviatt, owner and president, D. C. Oviatt & Co., Cleveland, since 1921, and active in the machine and steel business for the past 35 years, died recently. Prior to 1921 Mr. Oviatt was with the E. W. Bliss Co.

—o—

William S. Wadams, 85, retired maker of precision tools who worked with Thomas A. Edison in manufacturing the first motion picture machine, died June 28 at his home at Caldwell, N. J. He was manager, Bates Mfg. Co., West Orange, N. J., when the firm was merged with Thomas A. Edison Industries about 50 years ago, and later was with Ediphone Division of that organization.

—o—

Morris F. Benton, 74, chief type designer for many years of American Type Founders Inc., Elizabeth, N. J., died June 30.

—o—

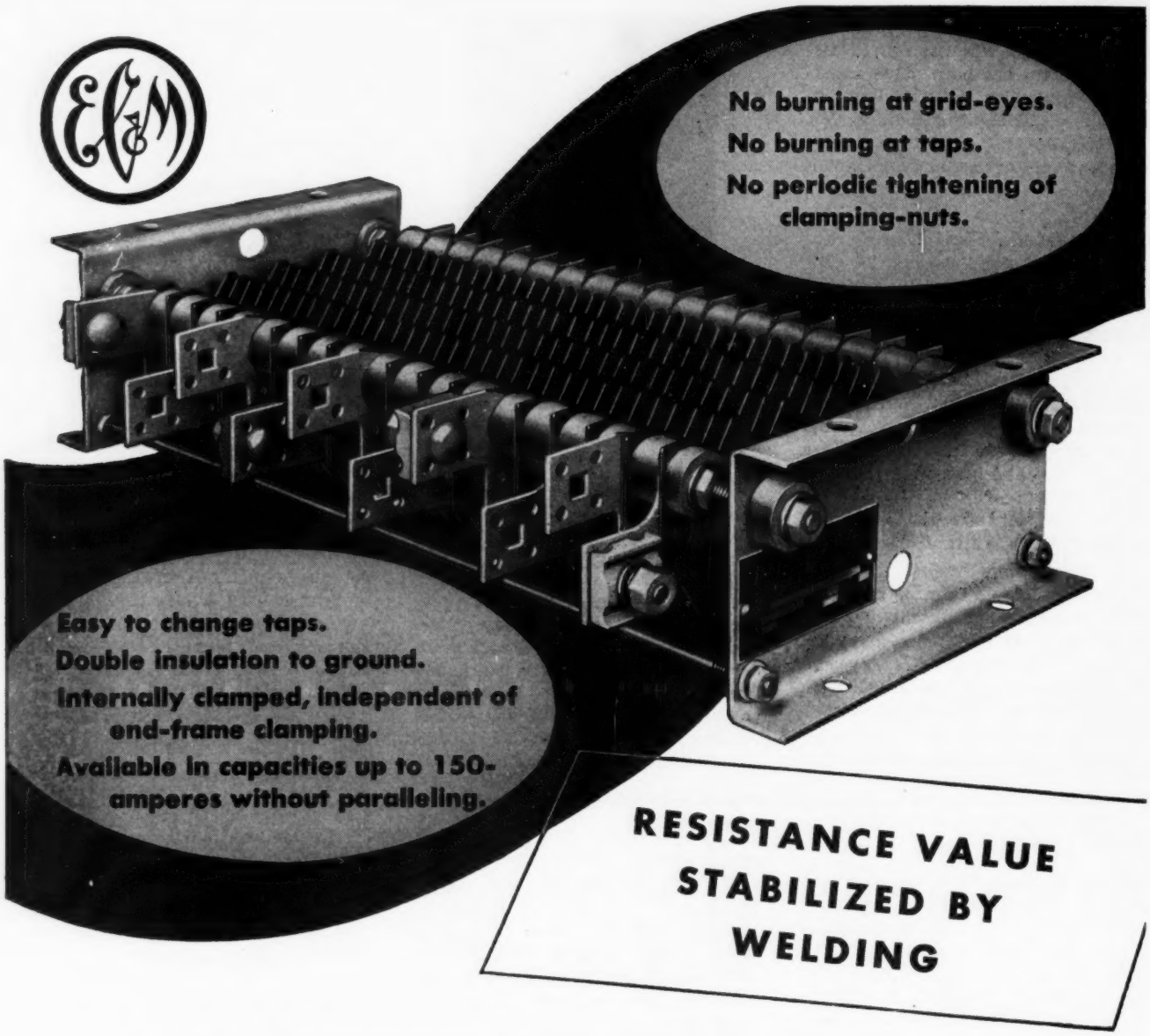
Joseph O. Amberg, 84, president, Steffens-Amberg Co., Newark, N. J., manufacturer of hardware supplies, died July 3.

—o—

Charles M. Hick, 62, advertising manager and office manager, Central Steel & Wire Co., Chicago, died July 4 in that city.

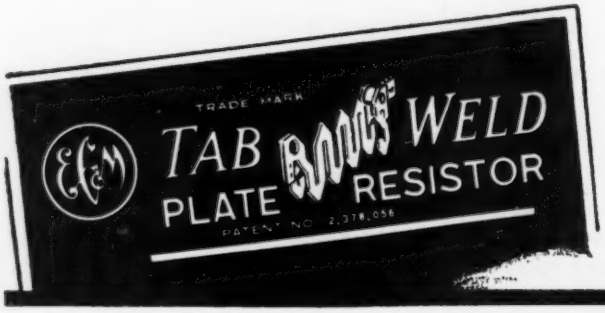
—o—

George W. Walker, 60, director of purchasing, Lincoln-Mercury Division, Ford Motor Co., Detroit, died in Henry Ford Hospital, June 29. After 10 years in purchasing activity for Cadillac, he went with Henry M. Leland to the newly organized Lincoln Motor Co. in 1917 and continued with the company after its purchase by Ford in 1922. When the Lincoln-Mercury Division was organized in 1945, he became director of purchasing, following wartime service in the Ford purchasing department.


No burning at grid-eyes.
No burning at taps.
No periodic tightening of clamping-nuts.
Easy to change taps.
Double insulation to ground.
Internally clamped, independent of end-frame clamping.
Available in capacities up to 150-amperes without paralleling.

RESISTANCE VALUE STABILIZED BY WELDING

Regular maintenance programs call for periodic inspection of all operating equipment, including the resistors. Due to the need for keeping production going, only a hurried examination can, at best, be employed. The clamping-nuts may be tightened, but the original resistance value is not restored if the grid-eyes have been burned while operating under loose pressure. *You never have to worry about the resistance value of EC&M TAB-WELD Resistors.* Welding of mated resistor-ends insures high capacity contact between grids. Tap-plates, welded in position at frequent intervals, provide rigid terminals for attaching external leads. For lower maintenance costs, use EC&M TAB-WELD Resistors.



SPECIFY EC&M Bulletin 942
TAB-WELD Resistors.

THE ELECTRIC CONTROLLER & MFG. CO.

2698 East 79th Street • Cleveland 4, Ohio

Engineering News . . . AT A GLANCE

MECHANICAL HELPER— When forced to use steel in form of sheets instead of coils in its shearing operations, one midwestern auto maker "recruited" the aid of an automatic stack lifter made by Hamilton Tool Co., Hamilton, O., to aid the operator in feeding sheets to the machine. At the plant, an overhead crane is used to deposit 10,000-pound loads of sheet stock on the lifter table positioned near the shear bed. Top sheet of the pile is kept at the same level as the shear bed automatically by a pushbutton operated motor. This enables the operator to slide sheets continuously into position for shearing in one easy motion.

STAMPING VIA TRANSFER TECHNIQUE— To date, several big presses are being used by AC Spark Plug Division of General Motors to process stampings by the transfer method. Largest press used by the company is a 500-ton unit which accommodates nine stations. Each of the stations, according to AC, is equivalent to a conventional press operation, even using the same tools ordinarily employed in a stamping press. The unit currently is producing the element retainer for silencers; this is made from strip stock handled in coils, and fed into the first station for blanking by an automatic feed attachment. Work is transferred from station to station by means of two longitudinal rails arranged along the bed on each side of the work stations, aided by work-grasping fingers that extend from the rails and which are spaced exactly on the centers of the individual stations.

"WEATHER-PLATED" TRAILERS— A rustproofing process, referred to as "weather-plating" is now used by Trailmobile Co., Cincinnati, to protect exposed ferrous portions of its new aluminum trailer currently in production. Material used in the process is a zinc-base liquid which, when dry, virtually plates the metal with a film of zinc. The company reports its engineers spent many hours with the material in learning and perfecting techniques for its application on the trailers.

ELIMINATES STREAKING AND SPOTTING— In New Haven, Conn., Enthone Inc., revealed development of a new additive for acid dips used prior to plating. Its function is to disperse and remove colloidal films from the surface of metals deposited during previous cleaning operations. The additive is reported to help eliminate spotting, streaking or staining of the plating. It is particularly beneficial in dipping operations involving nonferrous metals such as copper and brass prior to bright nickel plating.

ONE WAY TO JUMP PLATING OUTPUT— Both chromium and nickel plating are applied to vacuum cleaner parts in one continuous cycle by a specially designed electroplating machine recently installed in the Electric Vacuum Cleaner Division, General Electric Co., Cleveland. With the setup, parts are sent through the chrome-plating tank immediately following rinses after the nickel-plating dip. Use of the machine, it is reported, not only tripled output of plated parts in the same time cycle, but it also caused rejections to drop sharply due to uniform and automatic handling of all details in the process. Plating machine itself is roughly in shape of an oval, measuring 48-feet long. Tanks of various solutions occupy all sides of the oval, and a continuous conveyor moves around the machine over the tanks.

SQUEEZING-OUT ACTION—Lubricating film forming upon gear teeth must be able to resist the squeezing-out action that is developed, according to A. F. Brewer of The Texas Co., New York. Tips of teeth, he reveals, often exert a "smearing" action on the sides of adjacent teeth when rolling out of mesh, picking up a certain amount of lubricant previously forced down between them. If the lubricant is unsuitable the teeth may appear to be carrying a sufficient amount, yet this condition is present only after the pressure between the teeth is relieved. As soon as adjacent teeth engage, metal-to-metal contact may take place with resultant wear and abrasion caused by the lubricant's inability to withstand the pressure. (p.88)

PRODUCTION AT WILL—Production of any specific item can be started or stopped without unnecessarily tying up allied equipment or wasting any operator's time with the materials handling setup now employed in the Foundry Division of Eaton Mfg. Co., Vassar, Mich. Furthermore, material is transported to the operator's working level, eliminating any bending to the floor in processing work. Entire plant is built around the skip and lift fork truck. Each skip embodies a pair of trunnions set slightly back of center which rest in either of two sets of semicircular notches cut into the truck forks. Notches nearest the truck carry the box in a horizontal position, while those nearest the fork ends are used to dispose of the load, as the skip tips forward when lifted due to the off-center position of the trunnions. (p.93)

ELIMINATES SOFT FILMS—In finishing metal products, melamine resins offer two outstanding characteristics—high retention of color and luster at abnormally high temperatures; and fast curing rates, even at the lower commercial temperatures. Incorporation of melamine resins greatly assists in eliminating soft films even though hot from the baking ovens, thus facilitating quick handling of coated metal objects with less danger of surface injury. Modified coatings of melamine, it is pointed out, are valuable when applied to stove parts, electrical accessories and similar objects. (p. 97)

GEAR

Maintenance of lubricating film is an important requirement because of sliding action which prevails between gear teeth. Oily appearance sometimes deceiving as lubricant is squeezed out by contact pressure and is picked up again when teeth are rolling out of mesh

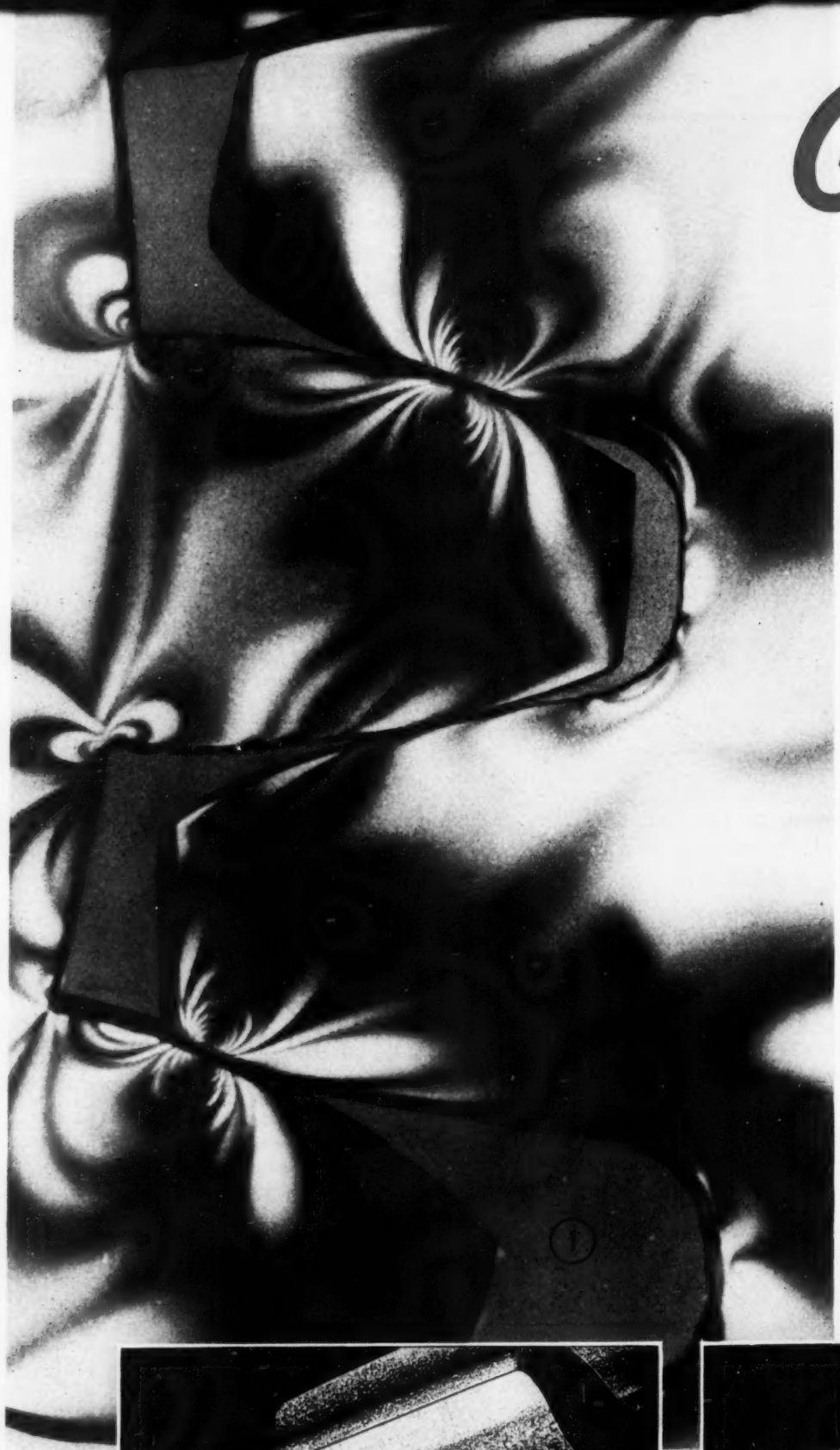


Fig. 1—Polarized light photography on photoelastic specimens indicates stress concentration in meshing gears. Stress is greater at square tooth roots on left than on rounded tooth roots at right

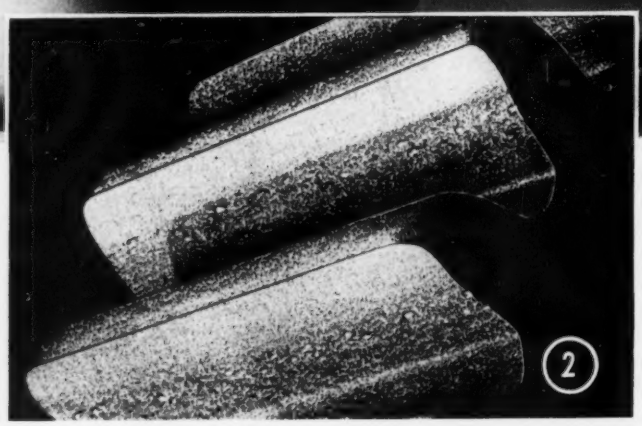


Fig. 2—Small pits, as large as head of a pin or smaller, usually start in vicinity of pitch line and frequently occur during initial period of gear operation. Pitting should not be considered serious unless it advances beyond initial stage

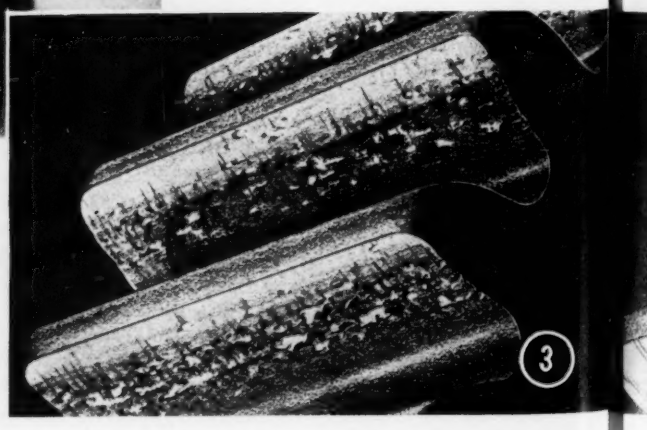


Fig. 3—Progressive pitting may result in a condition where unpitted areas are insufficient to carry load and complete destruction of tooth shape may occur

Fig. 4—Abrasion generally results from presence of dirt, grit or metallic particles in lubricant. Lack of proper lubricant may also give this result

LUBRICATION

In Modern Industrial Applications

By A. F. BREWER
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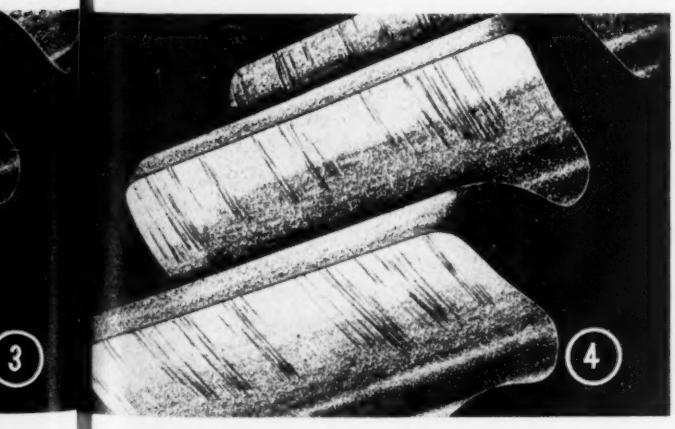
New York

GEARING—probably one of the oldest mechanisms for transmission of power, is also in its modern form probably one of the most controversial with regard to lubrication. The capacity of metallic gears was made use of by machine designers when the petroleum industry had developed sufficiently to furnish dependable lubricants which would effectually protect gear tooth surfaces from wearing too rapidly.

First petroleum gear lubricants were simply the residual products derived from refining straight mineral oils. They served the purpose very well until the reduction-geared steam turbine was perfected for marine service and more intricate trains of gears were applied to machinery where wide speed reductions were desired.

Gear lubricants were widely referred to as compounds for many years even though many types were straight petroleum or mineral oil products. It was a loose application of the word compound, for in petroleum parlance compound means a combination of a fixed or fatty oil with a petroleum oil. For the typical spur gear as employed on slow speed steel mill, cement and rubber machinery where rotational speeds do not exceed 100 revolutions per minute, these heavy bodied straight mineral oils sufficed. More fluid straight mineral oils of turbine grade, in turn, were better suited to high speed single helical and herringbone reduction gearing where pinion speeds may approach several thousand revolutions per minute.

At one stage in the early development of gear lubricants the thought prevailed that by thickening a medium viscosity petroleum oil with a material which might or might not have much lubricating value, the latter would take up the shock loads on the gear teeth somewhat like a cushion. Too often these were of doubtful lubricating value since some of them had little ability to re-establish a lubricating film on the tooth surfaces between successive engagements of the teeth.



Film Strength Needed—The necessity for adequate film strength in a gear lubricant became apparent when speeds and tooth loads were increased and when the protective ability of extreme pressure lubricants was demonstrated on hypoid gear tooth surfaces. Gear teeth, regardless of their design or the accuracy with which they are made, develop a combination of sliding and rolling motion as they pass into and out of mesh. Since sliding always prevails between gear teeth, maintenance of the lubricating film is a most important requirement.

In order to understand where film-strength fitted into the program of developing the modern gear lubricants the types of lubrication which can exist must be discussed. They involve:

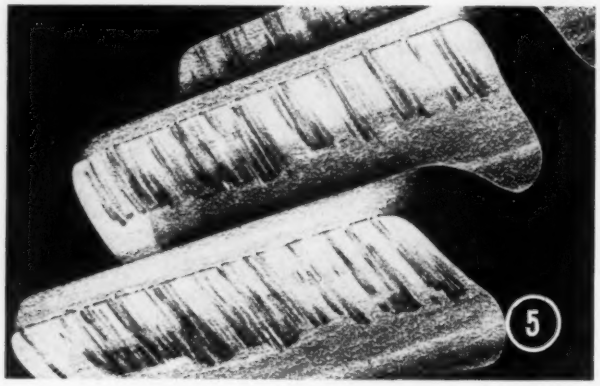
1—Thick-film or hydrodynamic lubrication.
2—Boundary lubrication.

In thick-film lubrication the parts are completely separated by a film of oil so when one tooth surface slides over the other the oil film will be sheared continuously.

If the viscosity is increased, the oil film becomes thicker and more work is required to turn the gears in and out of mesh. In other words, the friction is increased. However, if the oil viscosity is decreased, the film becomes thinner and although the work required then is less, the high spots on the tooth surfaces approach nearer to each other and the transition from thick-film to boundary lubrication is approached. Similarly, if the load is increased or the speed is decreased, the tooth surfaces approach each other and again the action approaches boundary lubrication.

Boundary Lubrication — When conditions of load, speed and oil viscosity are such that the oil film is too thin to completely separate the gear teeth, then the high spots may begin to touch each other. Thick-film lubrication no longer exists then and the condition is termed boundary lubrication. As the load is increased or the speed is decreased, more and more of the high spots tend to come in contact and the force required to turn the gears increases.

Research has shown that certain materials termed oiliness agents are effective in reducing friction under boundary lubrication conditions. These materials are high molecular weight organic compounds containing carbon, hydrogen and oxygen as compared to lubricating oils which contain only carbon and hydrogen. When one end of the lubricant molecule is highly reactive, it has the property of forming a powerful bond with a steel surface. Then it is called a polar



molecule. It is "adsorbed" to the surface so powerfully that the last traces in some cases can only be removed by grinding.

What happens at the surfaces of contacting high spots is interesting. In the case of steel on steel, the lubricant present, even the adsorbed polar molecules, cannot always prevent minute high spots from deforming and breaking off to form fresh surfaces of clean metal. When two freshly formed surfaces slide over each other, welding takes place and the rupture of the metal to form more fresh surfaces occurs. If conditions are right, more and more metal is torn off. By this time most of the prominent high spots have been removed and instead of welding of the small peaks of a few high spots, larger areas weld, thus leading to gross removal of metal. This is aggravated as the speed and load is increased.

Tooth Breakage—When a gear tooth fails it may involve actual breakage of one or more of the teeth, or there may be failure of the tooth surfaces. Tooth breakage is rarely attributable to faulty lubrication. Poor metal structure, faulty design, abuse or excessive overloading are more usually the cause. Lubricants which would otherwise be amply protective cannot insure against failure under such conditions, nor can they always keep the temperatures within reasonable limits.

On exposed gears, the lubricant must be adhesive as well as viscous—otherwise the film cannot resist the action of centrifugal force. There is no continuous replenishment of lubricant on the surface by dip or spray as is possible with enclosed gears.

Where dealing with bath or dip lubricated gears, the lubricant is chosen so that at the operating temperature the viscosity will be sufficient to train with the teeth. If the oil is too light an insufficient amount may be carried by the dipping gear to the companion gear or worm. In this case, the cooling ability of the lubricant will be lost. Under such conditions, a worm gear for example, may run so hot as to cause the threads to soften and crack, or to result in wiping of the bronze teeth of the worm wheel.

Progressive Wear—When the tooth surface of a gear becomes impaired, it may progress through several accepted states. First, more or less abrasion or rubbing off of the metallic surfaces occurs. Spur, helical or bevel gears will often become smooth and highly polished during the initial stages of abrasive wear. To some extent this could be regarded as a "wearing-in" procedure. It is regarded as being related to the viscosity of the gear oil, as it is apt to occur more rapidly with lower viscosity lubricants.

Galling and scoring often follow abrasive wear due to actual metal-to-metal contact. Here wear is more severe and tearing of the tooth surfaces is evidenced. Normally this occurs in the direction of sliding. Scoring develops regardless of the hardness of the tooth surfaces, but it often may show more of a tearing nature and develop into galling with softer surfaces where total absence of any oil film has permitted welding to occur between the high spots of the tooth surfaces.

Gear Seizure—Research has indicated that so long as the high spots on the teeth are at all times separated by several molecular layers of oil there can be no wear of the type known as abrasion or scoring. If the mechanical attack at the contact areas of metals rubbing together becomes severe enough to remove the ultimate protecting film, the clean metals will seize, possibly causing irreparable damage to the surfaces. This seizure, which is welding on a small scale, can become progressive to result in the gross removal of metal, i.e., tearing.

One of the most difficult problems of lubrication which has developed in recent years is in connection with hypoid gears. Intensity of load and speed of rubbing are such that a special lubricant is required. Under high loading the oil film between the high spots becomes extremely thin. So long as it exists at all there can be no clean metal contact, and therefore no abrasion, but this condition can only continue so long as the rate of removal of the film does not exceed its rate of renewal.

In industry, where gearing is adequately proportioned in line with American Gear Manufacturers Association practice, and housed, comparatively fluid lubricants are generally applicable. They are applied to the gear teeth and bearings either by force feed lubrication or splash in contrast to automotive service where bath lubrication prevails.

Initial Pitting — Pitting involves the formation of small pits in the tooth surfaces, usually starting in the vicinity of the pitch line, and frequently occurring during the initial period of gear operation. It involves actual removal of surface material to a depth dependent upon the localization of stress.

Fortunately, actual failure of gear teeth seldom occurs. Wear, scoring, incipient pitting and other conditions—may develop, as already stated, but they usually can be arrested by proper preventive measures

Fig. 5—Scoring results from excessive loading or inadequate lubrication. It may sometimes be eliminated in initial stages by substitution of a general purpose extreme pressure lubricant

Fig. 6—Burning, indicated by discoloration of tooth surfaces, is a sign of excessively high temperature which may be caused by overspeed, overload or faulty lubrication

Fig. 7—Chipping or spalling may indicate excessive brittleness when it occurs under normal load

with the result that the gear assembly in question will run successfully for years thereafter.

Lubrication engineers are handicapped when it comes to scientific methods for selecting gear lubricants. They have had to rely on accumulated experience. There are no generally accepted formulae as have been developed by students of bearing lubrication for plain bearing applications.

Testing Procedures—Laboratory testing procedures, so far, have not resulted in sufficient data which could be used to establish the relation of optimum oil viscosity to gear design, tooth loads, speed, operating temperatures and methods of lubrication where thick film lubrication is involved. On the other hand there are several devices for studying thin film or extreme pressure conditions, for example the Almen, Timken, S.A.E., Falex and Four Ball machines. While these machines have been very useful in controlling quality and uniformity, the data derived are not necessarily related to specific gear performance.

A comparison of interface action in these testing machines with the action at contacting gear faces indicates that these machines do not duplicate the conditions at the tooth surfaces of mating gears. Principal points of difference are that the tests involve a continuous constant velocity rubbing action which, in all but the S.A.E. machine, occurs without relief on a single spot of one of the contacting surfaces, whereas, actual gear tooth faces come into and then go out of contact, with a slide-roll-slide action.

Lubricant Qualities—Apart from what current research programs may prove or develop in the form of speed-temperature-load relationships to oil viscosity for various types of gears, experience has proved that certain definite physical or economic properties must be related to a gear lubricant if it is to be satisfactory in service. Prosaic method of "cut and try" indicates that according to the type of installation, it must:

1—Be adhesive (when used on exposed gears) to insure that a film remains on the teeth regardless of the action of centrifugal force.

2—Be of adequate viscosity so as to resist the effects of heat, and maintain a suitable film, regardless of tooth pressures or temperatures.

3—Show no tendency to channel, harden or become brittle and chip off in case of exposure to abnormally low temperatures.

4—Have sufficient "oiliness" or lubricating ability to reduce to a minimum the friction which occurs between the teeth under boundary conditions.

5—Be economical, so that it can be purchased and applied at a reasonable expenditure in comparison with the value of the service rendered.

6—Possess extreme pressure quality for hypoid gearing or heavy-load service.

Unit tooth pressures are high in the average gear installation, inasmuch as a relatively small area of contact is involved. Were rolling contact alone involved, the intensity of such a load momentarily on any part of a gear tooth could be disregarded as far as wear is concerned. But as sliding motion is involved most of the time this explains the abnormal wear that occurs even under normal loads where gears are not properly lubricated.

Practical experience over the years resulted in the development of a considerable variety of gear lubricants to meet the requirements stated above. Today they vary all the way from fluid mineral oils to intricate compounds. Any material which serves only as a thickener and has little or no lubricating value is not recommended for modern gearing.

Smearing Action—Lubricating film developed upon the gear teeth must be able to resist the squeezing-out action which is developed. Tips of the teeth often exert a "smearing" action on the sides of the adjacent teeth when rolling out of mesh, picking up a certain amount of lubricant which has been forced down between them. If the lubricant is unsuitable the teeth may appear to be carrying a sufficient amount, yet this conditon is present only after the pressure between teeth has been relieved. As soon as adjacent teeth engage, metal-to-metal contact may take place with resultant wear and abrasion, caused by the lubricants inability to withstand the pressure. Oftentimes, this can be proved by the presence of metallic particles when the used lubricant is subjected to laboratory analysis. Load carrying ability is most effectually obtained by using a lead-naphthenate compound which imparts mild extreme pressure characteristics to the lubricant.

Gear lubricants may be exposed to adverse operating conditions, according to the extent to which the gears are housed. Presence of considerable dust in the air as a result of material used, as in the cement, steel or rubber industries, may cause heavier gear lubricants to become veritable lapping compounds. Any type of dust is more or less abrasive; if it can-

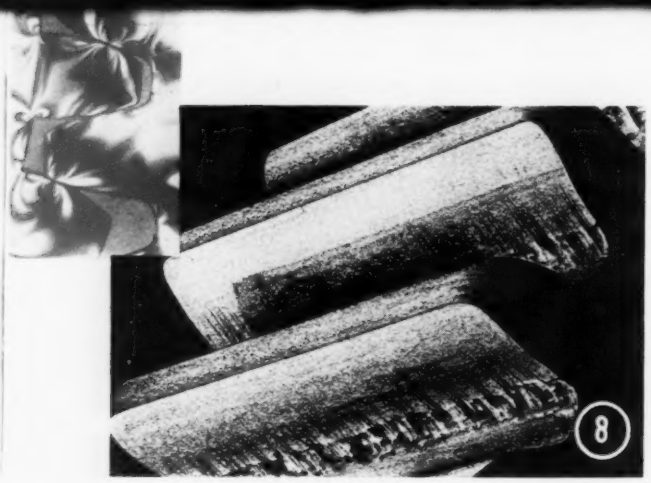


Fig. 8—Gouging may occur when there is interference between flank of driving pinion and tip of the driven gear

not be kept from contaminating a gear lubricant, the viscosity of the latter should be reduced in order to increase the washing action.

Power transmission gears must never run dry nor, in turn, should they be over-lubricated; this latter can cause churning losses and increase the difficulty in retaining the lubricant. According to the type of service experience has, to date, dictated approximately the proper viscosity, just as it has promoted suitable methods of application. Where gears are enclosed in cases which permit pressure splash or dip lubrication, the lubricant should be maintained at the level recommended by the manufacturer.

Bearing Pressures—Where heavy bearing pressures prevail, these may be transmitted to the gear teeth to some extent. Sometimes adjusting screws are employed to regulate the pressure to suit the work; widely varying duty may, therefore, be demanded of the reduction and driving gears.

To further appreciate the extent to which such conditions may affect the performance of a gear lubricant, it is interesting to note the several successive reactions to which the latter will be subjected. There are three distinct phases involved, viz.:

1. When the point of the gear tooth comes into contact with the root of the companion pinion tooth.
2. Where both teeth are in contact adjacent to their pitch lines.
3. Where the reverse of the first takes place as the teeth pass out of mesh.

Sliding motion occurs most actively when the teeth first come into contact and as they become disengaged. Both wiping action and squeezing will be apt to occur at these times. As the teeth become more and more engaged however, rolling contact becomes more pronounced. Wiping or scraping off of the lubricant is less apt to occur under these conditions, but the squeezing out action still is possible, especially as maximum contact pressures are encountered during the time the teeth are so engaged. Wear will occur more rapidly at the points and roots of the teeth due to the sliding friction involved; whereas, the intermediate tooth surfaces adjacent to the pitch line being subjected to rolling action will resist wear more effectively.

Types of Lubrication—Service involved dictates how a gear lubricant should be applied. Everybody is familiar with automotive practice where the gears in the transmission and rear end are bath lubricated. Contrast this with industrial production: Gears which drive the rolls on certain rubber machines, which may be either bath or hand lubricated; gearing on excavating machinery is largely hand oiled; and turbine reduction gears are lubricated by force-feed.

Gear lubricants must be protected against contamination in service whenever possible. Where pans are furnished for bath lubrication these should be cleaned out at regular intervals, since any dust that may have gained entry will impair the adhesiveness and affect the lubricating ability of the gear lubricant. Gears which dip in a bath of lubricant require a bath just deep enough so that the lowest teeth are just covered. This will give ample lubrication and keep the consumption of the lubricant at a minimum.

Heavy Lubricants—Gear lubricants designed for application by hand usually are so heavy in body as to require heating to reduce them to the consistency desired. They are applied hot by brushing or spraying or pouring onto the teeth as the gears are slowly revolved towards each other. Pouring the lubricant on in a fine stream is easy, economical and effectual.

Lubricants should be applied to open gearing relatively frequently and in small quantities, rather than in considerable volume and at longer intervals. Thus there will be less danger of gobs of lubricant being thrown off by centrifugal force, to possibly contaminate the products passing through the machine.

Lubrication of worm reduction gears (bronze to steel) has been the subject of considerable study during recent years. There has been a definite trend away from the time-honored compounded steam cylinder oil as a general recommendation for such gears in severe service. Modern lubricants compounded with lead soap and sulphurized oils which are noncorrosive and have excellent stability even at high operating temperatures, are receiving more favor.

Automatic Lubrication—Worm gears are distinctive in that their design and method of housing enable the use of comparatively fluid lubricants. Worm gears are rarely exposed so automatic lubrication activated by the meshing of the gears themselves is practicable, involving an oil bath or specially designed oil circulating system.

For lubrication to be effective an ample film of lubricant must be kept on the worm and gear teeth to prevent wear, to reduce the starting and operating torque as far as possible and to lubricate the shaft bearings with a minimum of frictional resistance. Ball and roller bearings are extensively used in such installations, especially for the worm shaft, and for the purpose of taking up end-thrust.

Where worm gears are bath lubricated the level of the oil is of decided importance, for the development of drag or excessive internal friction may have an appreciable effect upon power consumption. As a rule the oil should be carried at such a height as to insure suitable dipping of the teeth of the lower element; submergence of too much of either the gear or worm is not advisable. Where the worm is located below the wheel or gear, the oil level should usually be carried at the center- (*Please turn to Page* 122)

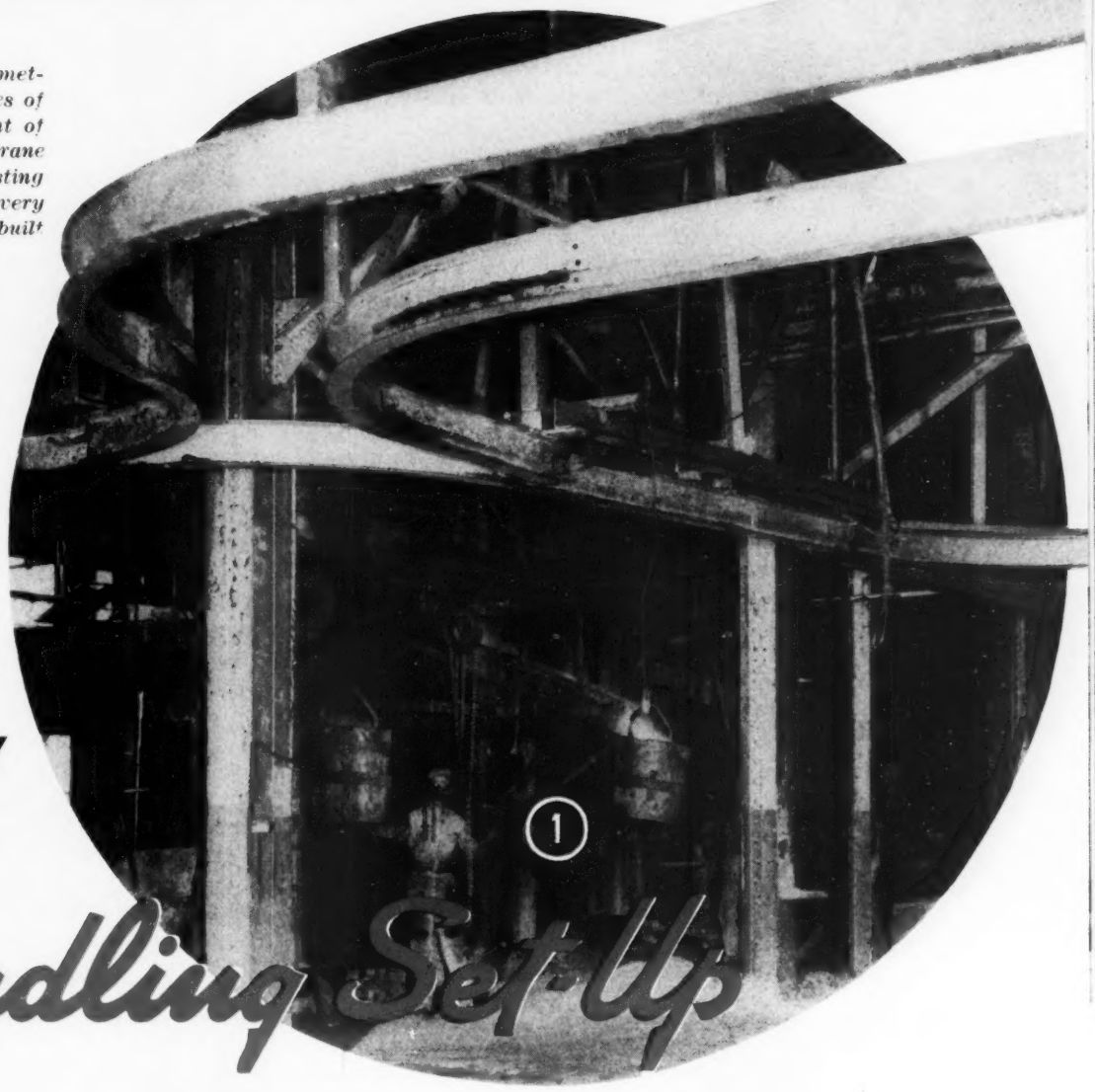


Fig. 1—Tapping cupola metal into a bull ladle, series of switches directly in front of furnace area. Mono-rail crane system and novel hoisting arrangement on delivery ladle were designed and built by Eaton Mfg. Co.

By DAN REEBEL
Associate Editor, STEEL
Photography by the author

FOUNDRY ① Handling Set-Up

...provides fluid production with custom versatility

Production of any specific casting may be started or stopped without tying-up allied equipment or wasting operator's time. Plant lay-out is designed around the lift-fork truck and tote box as the prime material movers

EMPLOYMENT of efficient materials-handling techniques in combination with metallurgical control and fluid plant layout, enables the Foundry Division of Eaton Mfg. Co., Vassar, Mich., to produce as many as 60,000 separate castings per permanent mold machine each 16-hour work day. Overhead, belt and gravity conveyors, bins, skips, tote boxes and lift fork trucks efficiently transport material to the operator's working level, obviating any bending to the floor for securing or disposing of material while in process.

The entire plant layout is built around the skip and the lift fork truck. Each skip has a pair of trunnions set slightly back of center which rest in either of two sets of semi-circular notches cut into the truck forks. Notches nearest the truck carry the box in a horizontal position, while those nearest the end of the forks are used for disposal of the load as the skip tips forward when lifted due to the off-center position of the trunnions. The metallics used to produce a gray iron casting are transported approximately seventeen times while in process. Thus each ton of castings shipped results in a 17-ton materials handling problem throughout the plant. With this material handling set-up, production of any specific item can be started or stopped without unnecessarily tying up allied equipment or wasting operator's time.

Hot metal taken from the cupola is transported by a bull ladle to small pouring ladles located at the machine. The pouring ladle is suspended from the ceiling on a ball and socket joint which allows for necessary swing as the permanent mold machine is rotating. The bull ladle, pushed by a ladleman, runs on its own overhead conveyor system. Utilizing a series of switches placed directly in front of the furnace area, the conveyor offers extreme flexibility in handling hot metal from any one of the three cupolas at will.

In the production of permanent mold castings, metal composition is of utmost importance if sound cast-

ings with attendant low scrap loss is desired. Cupola charges consisting of the necessary ingredients must be exact and properly spaced and the blast balanced to produce a metal temperature of approximately 2800° F at the spout. Composition of the cupola metal is approximately as follows: Carbon 3.45-3.65, silicon 2.45-2.65, sulphur 0.10 maximum, manganese 0.70-1.00, phosphorus 0.35 maximum.

The permanent mold machine is an actuating mechanism for opening and closing permanent molds attached to the 12 arms radiating out from a turntable, rotating around a central hub. Complete cycle of the machine takes from 3 to 6 minutes during which time metal is poured, cooled and the resultant casting ejected from the mold. Ordinarily, two operators are required—one to pour molten metal into the molds and the other to remove the castings after the molds are mechanically opened near the completion of the machine's cycle. Molds are then automatically cleaned, coated and closed preparatory to another cycle of operation. If cored castings are being produced, a third operator is used for setting cores in the molds.

The 12 molds on the permanent mold casting machine are preheated to 500° F before any pouring takes place. As many as 12 different type castings can be made on one machine. Only factor to be considered is that the mass of metal in each mold be in balance with every other mold. The reason for this is that pouring and cooling time which is determined by the amount of heat to be extracted from the casting, necessarily demands that the volume in each mold be approximately equal.

During a day's operation, molds are maintained as closely as possible to 700° F. This is accomplished by adjusting the speed of the machine in accordance with the length of time necessary for casting solidification. Standard procedure is to set the cycle of the machine according to past experience with castings of similar mass and contour and then to accelerate or decelerate to secure the exact cycle speed for most efficient operation and production of sound castings.

Castings are poured and within 40 to 120 seconds have solidified to the point where they may be removed and thrown into tote boxes lying adjacent to the removing operator's station.

Following the removal of the castings, molds pass in front of a blast of directed air, which cleans the cavity of excess soot and dirt. Molds in this position are now under a smoke hood where they are given a coating of acetylene smoke. If a core is to be used, it is placed in the mold immediately following the smoking operation. Molds are then automatically closed and again ready for pouring.

The core room is modern throughout, utilizing core blowing machines of the latest design and vertical continuous core drying ovens which guarantee a continuous supply of thoroughly baked cores.

Gates and sprues of castings are removed by running the product through a continuous mill after which they are ejected onto a endless belt conveyor which passes material in front of sorting operators who segregate castings as to part number and de-

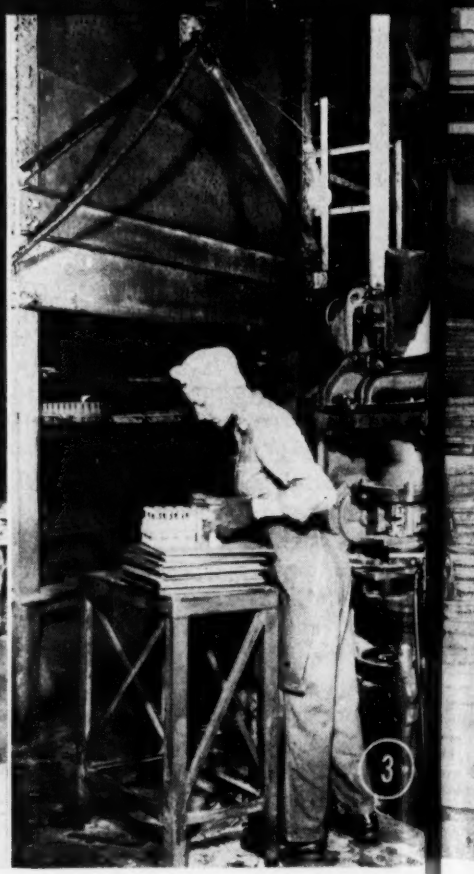


Fig. 2—View of inspection row showing hoppers for delivery of material to inspectors

Fig. 3 — Vertical continuous drying oven for processing cores produced on blowing machine shown at right

Fig. 4 — After leaving continuous mill, castings move on an endless belt conveyor before sorters who segregate material as to part number and deposit it into skips shown at left

Fig. 5—Tray of castings being placed at entry end of an annealing furnace

Fig. 6 — Pouring hot metal from bull ladle into small ladle at permanent mold machine

posit them into waiting skips in front of the moving belt.

To guard against the possibility of slightly chilled corners and for removal of any stresses or strains caused by rapid solidification of the metal, all castings are passed through annealing furnaces. These units are of the open pusher type with castings being transported on trays. After trays are positioned for entry into the annealing furnace, the operator loads the empty trays with castings. Push is about every 3½ minutes, and the cycle is 1½ hours up to temperature; held at temperature of 1625-1640° F for 30 minutes and then gradually cooled for 1½ hours as trays move on to the discharge end. As trays leave the end of the annealing furnace, they automatically tilt and deposit castings into a waiting tote box or skip and are then returned to the front of the furnace on a monorail conveyor. Any oxide scale incident to open furnace annealing is removed by shot blast machines.

Castings to be ground are elevated while in the skip by lift fork trucks and deposited in gravity hoppers which channel the material down to the operator's level at the grinding wheel. After finish grinding, the operator deposits the part into a waiting skip located in back of his station ready for inspection.

Some castings such as valve guides for automobile and truck engines and washing machine parts of many different cylindrical types are end and centerless ground before shipment.

After inspection, castings are packed in burlap bags, loaded into skips and transported into railroad cars or waiting motor trucks by means of the fork lift truck.

Permanent mold gray iron castings are popular due to their dense uniform structure which affords easier and higher speed machining. These castings have found use for carburetor parts which must contain gasoline without leakage. They are also used for holding liquids and gases under pressure such as found in hydraulic systems and refrigerating units. They can be surfaced to a mirror-like finish due to their fine grain structure and may be produced in simple shapes or in complex cored designs.

Permanent mold gray iron castings exhibit a microstructure of finely dispersed eutectiform graphite and ferrite.

This division utilizes 125,000 square feet of modern brick and steel buildings which are particularly adapted to production of permanent mold gray iron castings. The melting department having a capacity of 250 tons per day of cupola iron is equipped with complete automatic charging and modern material handling equipment for supplying the 16 permanent mold machines being operated.

Throughout the plant, exhaust systems are in operation which remove all smoke and fumes thus giving the layout more the appearance of a food preserving factory than a modern high-speed industrial gray iron foundry.

Fig. 7—Elevating a load of castings into hopper at one of the grinding stations. Skip for finished work shown in left foreground

Fig. 8—Filling hopper of continuous mill with castings for removal of gates and sprues

Organic Finishes

FOR METAL PRODUCTS

Part V of the current series reviews properties and applicability of amine-formaldehyde resin coatings, melamine resins, silicone resin, alkyd resin, cellulose base coatings, high solids metal lacquers and other cellulose finishing materials

Previous articles in the current organic finishing series appeared in the following issues of STEEL: May 17, 1948, p. 77; May 31, 1948, p. 56; June 14, 1948, p. 56; June 28, 1948, p. 56.

WHERE the decorative element is important, and where chemical resistance need not reach the maximum level, another group of thermoplastic resins becomes of prime importance in industrial coating applications. These are the amine-formaldehyde resins, condensation products of formaldehyde and amine resins such as urea or melamine. Condensed with higher alcohols, such as butyl or capryl, water white resins, soluble in aromatics and heat convertible to a colorless film are obtained.

If used alone, films of great hardness, but poor adhesion and gloss are obtained, so they are usually modified with drying or non-drying alkyd resins, or other plasticizers. Chemical resistance may be diminished by these additions, but the improvement in other factors warrants this in most of their applications.

When formulated with coconut oil and castor oil alkyds, or their mixtures, the excellent initial color and color retention properties of urea resin have contributed greatly to the development of modern refrigerator, kitchen cabinet, kitchenware, bathroom and hospital equipment finishes.[43] Urea resins in combination with certain alkyds, modified with a number of common vegetable drying oils have shown outstanding interior and exterior durability when applied on transportation equipment and household items such as washing machines. Urea resins have been widely used in white enamels for fluorescent lighting fixture reflectors.

Melamine Resins—Melamine resins, adaptable to surface coatings for metal products are made by reacting melamine with formaldehyde and other materials. Melamine resins have two outstanding characteristics[43]: First, high retention of color and luster

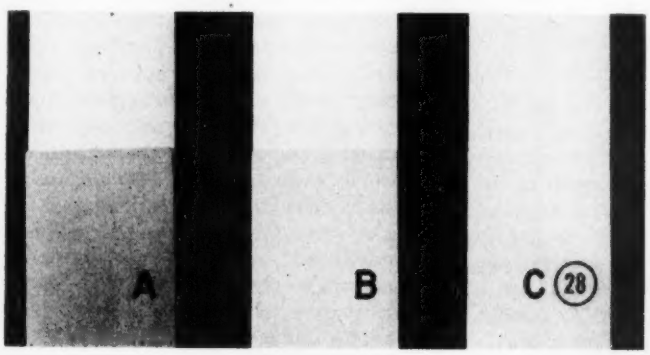


Fig. 29—Resistance of silicone resin finish to warm dilute nitric acid (3 per cent at 100° F) A—Alkyd-melamine, 24 hours; B—alkyd-silicone, 100 hours; C—silicone 100 hours

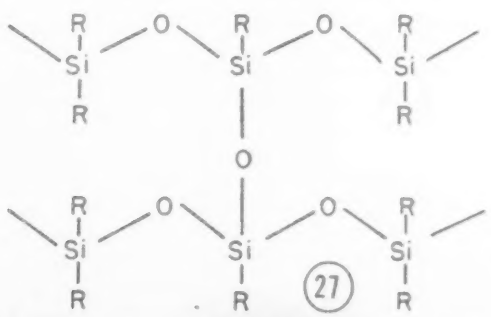


Fig. 27—Probable molecular structure of a cross linked silicone resin

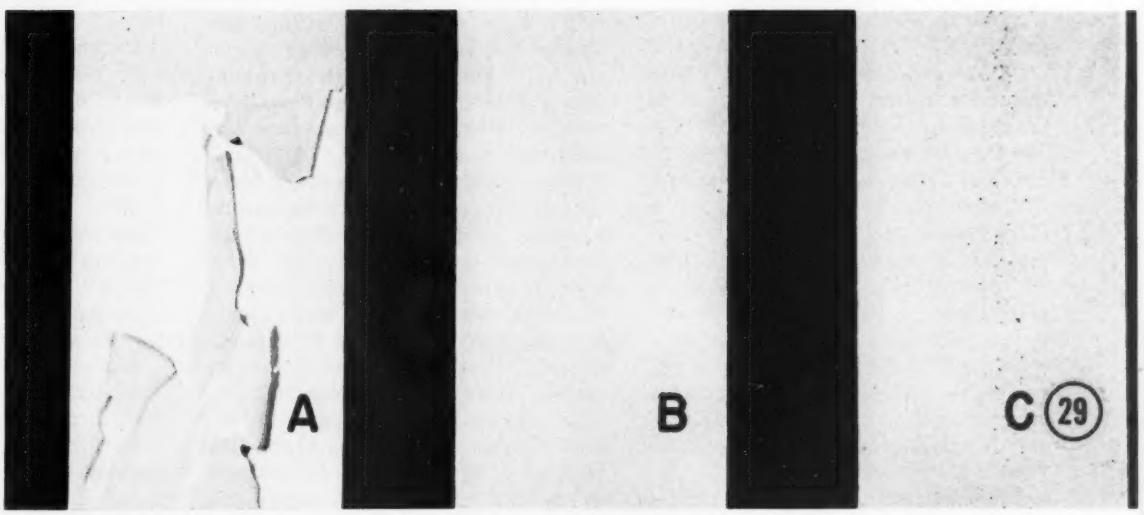


Fig. 28—Color retention of silicone resin finishes at high temperature (480° F) A—Alkyd-melamine, 2 hours; B—alkyd-silicone, 2 hours; C—silicone, 24 hours. Original panels at top

Fig. 30—Resistance of silicone resin finish to warm dilute sulphuric acid (3 per cent at 100° F) 100 hours. A—Alkyd-melamine, B—alkyd-silicone, C—silicone

Fig. 31—Resistance of silicone resin finish to warm dilute caustic soda (3 per cent at 100° F) A—Alkyd-melamine, 24 hours; B—alkyd-silicone, 48 hours, C—silicone, 100 hours

at abnormally high temperatures; second, fast curing rates, even at the lower commercial temperatures. These properties are desirable in many special applications of coatings for metal products. Incorporation of melamine resins greatly assists in eliminating soft films, even though hot from the baking ovens, thus facilitating quick handling of the coated metal objects with less danger of surface injury. Melamine modified coatings are valuable when applied to stove parts, electrical accessories and similar objects adjacent to a source of heat. They find particular use in white or pastel shades, or colors having clean hues. In addition to excellent color retention, the melamine coatings are noted for their ability to impart maintenance of film gloss at the higher temperatures, and are widely used in finishing metal products where this factor is considered important.

It is generally considered that melamine resins exceed urea resins in range of compatibility with pigments, solvents, oils and other resins normally used in surface coatings. Likewise, baked coatings based on these resins are superior to corresponding urea resin types in their resistance to abrasion, outdoor exposure, water and chemicals. The experienced finisher, in comparing them with the thermosetting phenolic types, previously discussed, will recognize a superior resistance to electrical arcs and less tendency to discolor on exposure to heat and light.

Organic-soluble melamine resins are applied advantageously as surface coatings, when plasticized with alkyd resins. Where color retention is a prime requisite, as in a high bake refrigerator enamel, alkyd resins of the saturated type are generally used; for maximum hardness, adhesion and baking speed, on the other hand, the oxidizing type alkyd resins are generally preferred. In general, melamine resins have shown outstanding durability in conjunction with alkyd resins, making possible the formulation of industrial fast-baking coatings with maximum chalk resistance and resistance to fading.

These resins appear on many home appliances, such as refrigerators, washers, steel kitchen cabinets, etc. The amine-formaldehyde resin coatings, as a group, generally afford a complete choice of color, particularly nonyellowing whites, give hard tough durable films at relatively short bakes. Their chemical resistance is high against humidity, fruit acids, mild alkalies and detergents, and fats and oils. They are flexible enough to permit coating steel strip and winding in coils for making venetian blind slats. Industrially, these finishes are of prime importance and as of today offer perhaps one of the best of choices for finishing mass production steel articles to be used in ordinary environments.

Within the first few years after they became available it is important to note that the alkyd-melamine combinations were adopted for quality finishes for automobiles, refrigerators, machinery, metal furniture of many types, washing machines, bathroom and kitchen appliances, as well as for many other household and industrial appliances. Not only do they insure maximum protection, but they have the advantage of permitting speedy production by the use of relatively quick cures at high baking temperatures.

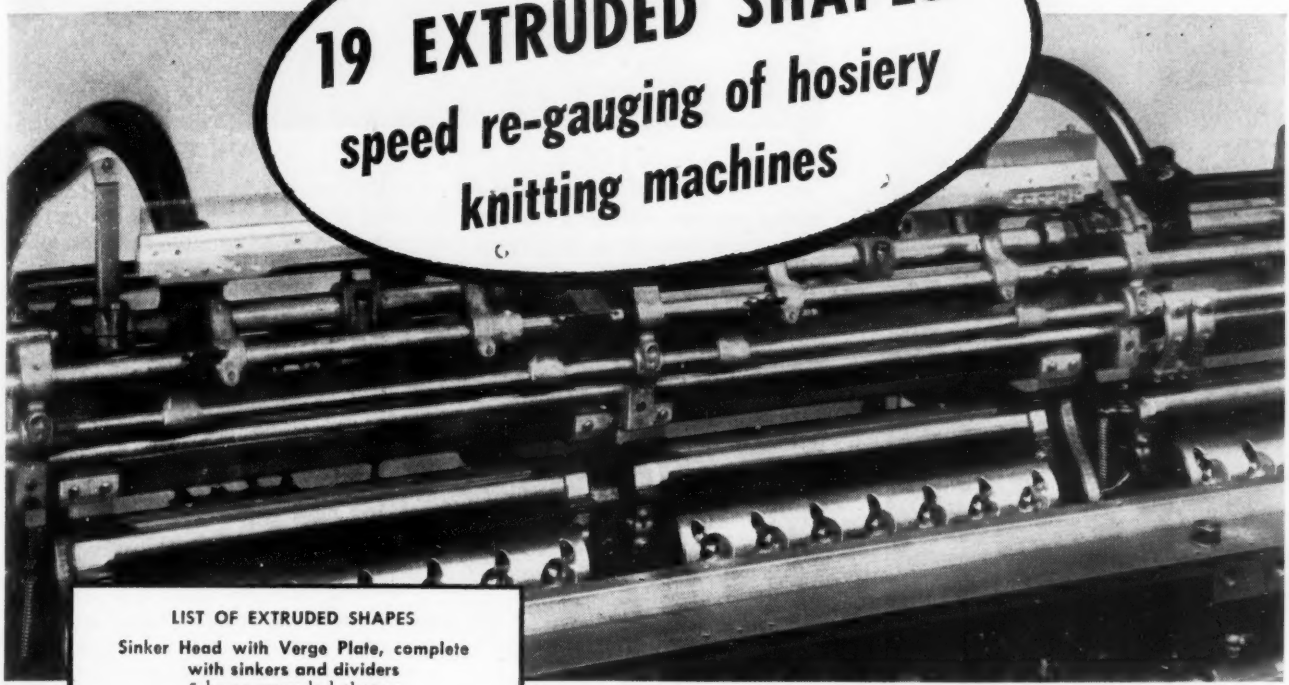
In the case of trucks, automotive equipment and other massive metal appliances this may readily be accomplished by the use of infrared baking lamps, while the melamine-alkyd modified resin coatings have been cured on smaller appliances and such metal products as instruments using almost any type of baking equipment from infrared lamps to steam heated ovens in some cases. Excellent resistance to discoloration and abrasion is advantageous in white enamels for tank interiors and in clear coatings used for light reflectors.

Silicone Resin Coatings—Another member of the thermosetting resin family, the silicones, appears potentially to be very important in applications for protective and decorative finishes. In general, other synthetic resins consist mainly of molecular chains and rings with carbon linked to carbon. Some of these linkages are unsaturated and open to oxidation and other chemical changes. Basic structure of silicone resins is believed to be oxygen-silicon-oxygen, and thus similar to the molecular structure of quartz.

Organic radicals such as methyl and phenyl are attached to the silicon in this structure to provide solubility, flexibility and toughness. The relative stability of the silicon to oxygen linkage, plus the presence of little or no unsaturation is thought to be considerably responsible for the unusual resistance characteristic of the silicone resins.[45] Fig. 27 is an illustration of the molecular structure of a silicone resin.

Silicone resins can be made to be compatible as cold-blends with other film forming materials such as urea-formaldehyde, ethyl-cellulose, and acrylate resins. However, these blends are usually inferior to products which

19 EXTRUDED SHAPES speed re-gauging of hosiery knitting machines



Two sections of a hosiery knitting machine, converted to 51 gauge by Fred C. Good & Sons, Inc., Philadelphia, with extensive use of Revere Extruded Shapes.

LIST OF EXTRUDED SHAPES

Sinker Head with Verge Plate, complete with sinkers and dividers
5 brass extruded shapes

Knocking-Over Bar
2 brass shapes

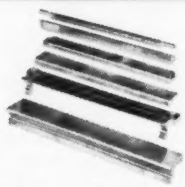
Welt Bar
2 aluminum extruded shapes

Picot Bar
2 aluminum extruded shapes

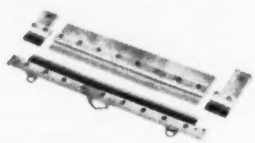
Narrowing Fingers
1 brass, 1 aluminum shape

Jack Bed and Spring Bar
5 brass shapes, 1 aluminum

Needle Bar
2 magnesium, 1 brass shape



Some parts of the Sinker Head, and Knocking-Over Bar, with the Extruded Shapes from which they are made.



Narrowing Fingers, Picot Bar, Welt Bar, all using Extruded Shapes.

Needle Bar, with the larger of the two magnesium Extruded Shapes that save so much weight.

YOU would never think that a business such as Revere's would be affected by fashion, but sometimes it is. Take women's hosiery. The demand for sheer stockings has resulted in a tremendous re-gauging of knitting machines, to convert them to 51 gauge from the coarser pre-war gauges. In carrying out such re-gauging, Fred C. Good & Sons, Inc., Philadelphia, Pa., has become a good customer for Revere extruded shapes, which are used in making new essential knitting parts, except, of course, the needles.

The Revere Technical Advisory Service collaborated closely with the Good engineers in this wide use of extruded shapes, with particular attention to flatness, straightness, and uniformity of alloy and temper. Knitting to fine gauges means narrow tolerances. In 51 gauge, for example, 476 sinker slots have to be cut in 14″, and the tolerance overall must be held to 0.0015″. This requires especially uniform material to begin with, such as Revere supplies and exceptional machining skill.

The demand for finer gauge full-fashioned stockings (50 million dozen pairs per year) has made higher machine speeds desirable. Use of magnesium in the needle bar, the largest vertically-moving part, saves about 2/3 the weight of the previous steel or iron bar, with less vibration and somewhat lower power consumption. But according to the Good company, Revere's chief contributions have been these: supplying uniform metals that can be finished to the closest tolerances, and working out the application of extruded shapes to reduce the amount of machining, making possible lower costs and a higher rate of production . . . Perhaps Revere can do as much for you. No matter what you make, why not ask the nearest Revere Office to send a man over to discuss the advantage of extruded shapes in your business?

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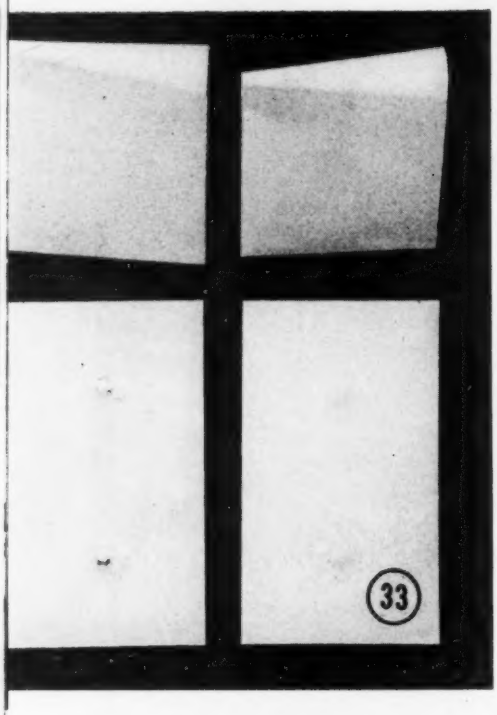

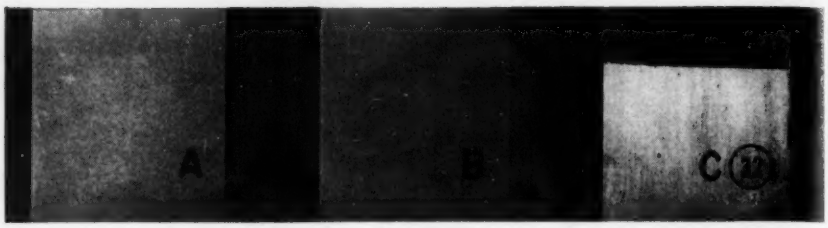

Fig. 32—Silicone resin finishes show inferior resistance to hydrocarbon solvents as illustrated in this test with high test gasoline (77° F, 120 hours). A—Alkyd-melamine; B—alkyd-silicone; C—silicone

Fig. 33—Effect of primer on shock and bend resistance of silicone resin finishes. Left—silicone over bare metal; right—silicone over primed metal; top—bend test at 77° F; bottom — shock test at 77° F. Courtesy General Electric Co.

are made by chemical co-condensation. Alkyd-silicone co-condensations are of particular interest for their promise of unusual hardness, adhesion, toughness, and heat and chemical resistance. However, it has been pointed out[45] by the General Electric Co., who have taken an active interest in developing metal finishing uses for the silicone resins, that much laboratory work remains to be done on these combinations before they will be generally available to the metal finishing industry.

Color retention at high temperature is an outstanding and readily demonstrated silicone characteristic. Fig. 28 shows how well a silicone white enamel withstands temperatures as high as 480-500° F. Very little discoloration is shown in 24 hours, while in 2 hours an alkyd-melamine discolored badly and an alkyd-silicone discolored appreciably but much less than the alkyd-melamine.

Resistance to Dilute Acids—Resistance of silicone and alkyd-silicone resins to many dilute acids is excellent. Three per cent solutions of hydrochloric, sulphuric, nitric and lactic acids at 100° F have little or no effect. Figs. 29 and 30 show the resistance of silicone finished test panels to dilute nitric and sulphuric acids. In addition, tests have shown silicone resins to have excellent resistance to dilute alkali solutions. Immersion in a 3 per cent caustic soda solution at 100° F for 100 hours was found to have little or no effect. Under the same conditions, as is shown in Fig. 31, an alkyd-silicone was badly attacked in about 50 hours, and an alkyd-melamine was found to fail completely in 24 hours.

Inferior resistance to hydrocarbon solvents is a weakness of silicone resin finishes. Fig. 32 shows the results of immersion in high-test gasoline. The alkyd-melamine and alkyd-silicone were unaffected after 120 hours, except for slight softness while wet. The straight silicone was completely dissolved. In alcohol, results with all three types of resins were found to be similar. Silicone finishes have been found to show little or no staining by such potent staining agents as iodine, mercurochrome, mustard and grape-juice.

Possibly one of the most useful qualities of the potential group of silicone finishes will be their superior weather resistance. It is reported[45] that General Electric laboratories exposed a panel coated with a white silicone finish on their Schenectady test fence for nearly 4 years, after which time it showed no change except the usual dirt-collection. It is also reported that another set of exposures of phthalocyanine blue tinted, chalking-type, anatase-titanium oxide enamels have not chalked or faded after 18 months exposure, where the alkyd controls in this set had chalked and faded considerably.

It is expected that the relative easy solubility of silicones in hydrocarbon type solvents will result in the availability of fairly high solids silicone finish in such solvents as petroleum spirits or Xylol, estimated by G. E. to be a probable consistency of about 70 per cent solids. Recent developments have reduced the baking schedules to more practical levels. With the newer resins, ½ to 1-hour at 400° F or 1 to 2 hours at 300° F, are reported to be suitable for most uses. Straight silicones can be made hard enough to air dry by evaporation, but they may be too thermoplastic and are much inferior in chemical and weather resistance to heat-cured silicones. It has been predicted that future work will provide alkyd-silicones which will be more suitable for air drying.

By nature, probably because of low molecular polarity, silicone finishes are deficient in adhesion. This can be overcome by using a primer, and satisfactory results have been obtained with alkyd-melamine resin primers. A conventional coconut oil alkyd and melamine resin white enamel has been used as a primer, with no sacrifice in heat and chemical resistance. With a drying oil alkyd primer, enough discoloration was observed to occur at high temperatures to show through the silicone top-coat. Best results were obtained by using the primer, at low solids, and applying only a thin mist-coat. Following this, the top coat is applied and both coats are baked at the same time. Fig. 33 shows the value of using a primer, where it is shown that a silicone finish has enough flexibility to take a conical bend without a primer, but not enough adhesion to withstand a sudden impact or shock without it.

Alkyd Resin Coating—The group of alkyd resins is recognized as one of the most important and widely used types of synthetic finish for metal products. Alkyd resins serve as major ingredients of both air-drying and baking finishes, suitable for inside and outside exposure. These resins are formed from the heat reaction of polyhydric alcohols and polybasic acids. Most common example of such a reaction is that of glycerol with phthalic anhydride, giving rise to the universally used product, glycerol phthalate. Other polyhydric alcohols such as ethylene and diethylene glycols, pentaerythritol and the like may be cross-blended with glycerol, or used alone. Likewise, other dibasic acids, such as adipic, succinic, maleic, citric, and sebacic can replace phthalic anhydride as a constituent.[46]

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sins in the metal products coating field has been attributed to a number of reasons. Severe tests have proved that alkyd enamels exhibit good resistance to water, chemicals and gasoline. Many forms of commercially available alkyd resin finishes have proved themselves to be outstanding in retention of gloss and color after exposure, and their durability has been found to be excellent. The glycerol-phthalate resin has the unique property of being unusually resistant to the destructive effects of ultraviolet light.

As a result, alkyd resins are used in the metal finishing industry in several ways, the largest proportion being employed as the sole vehicle for both air drying and baking applications. This general type of synthetic, in all its variations, has proved so versatile that it now appears in architectual finishes, coatings for transportation equipment, and enamels for general household and office metal fixtures. Increase in alcohol, perspiration, and oil resistance in coatings produced from phenolic modified alkyds has promoted their use upon metal chairs, desks, filing cabinets and similar applications. It has been predicted that alkyd resins used by themselves will find wide application for exterior and interior air drying architectural finishes.

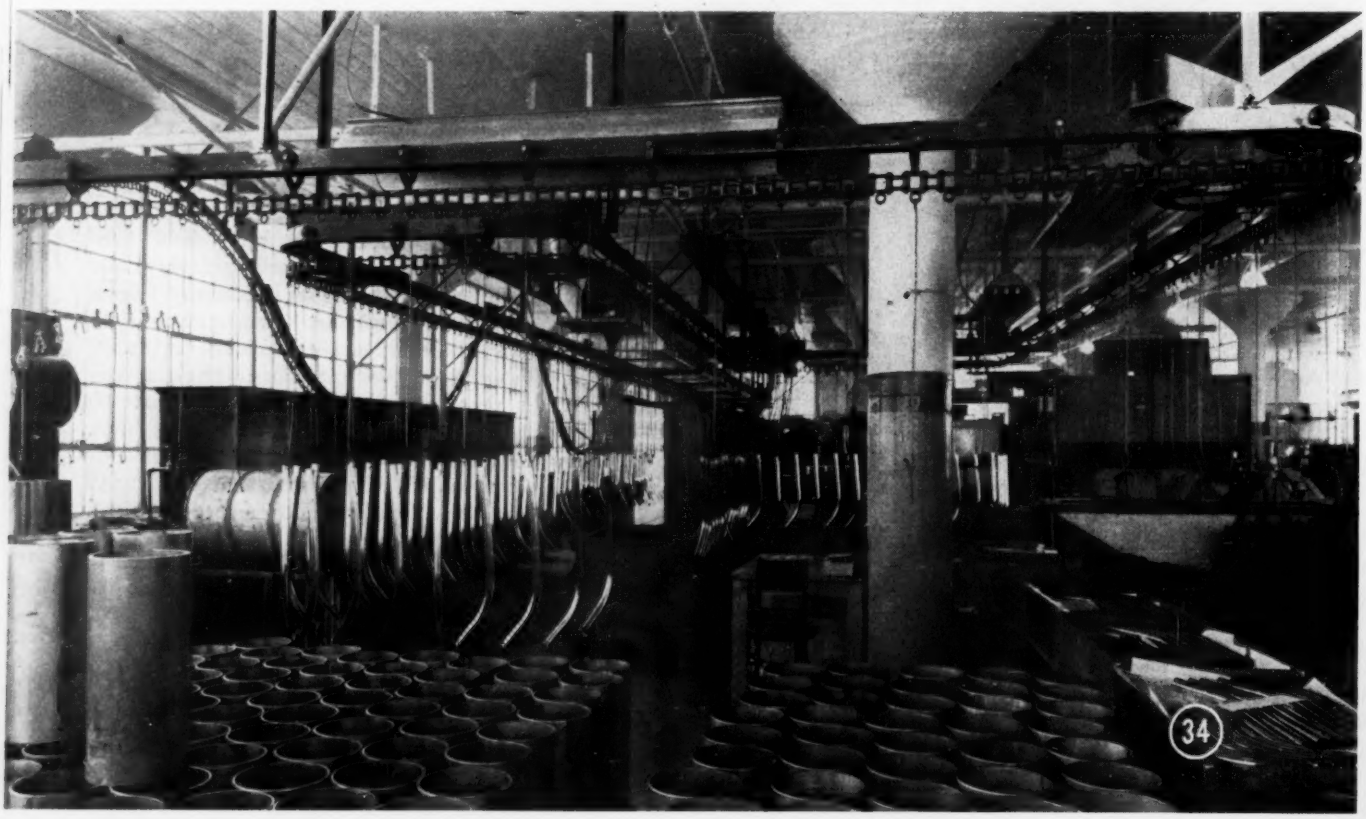
Alkyd resins have been used with cellulose derivatives to produce fast, air-drying finishes. They have been used to fortify oil paints and varnishes and also in combination with melamine-formaldehyde and urea formaldehyde. Various types of alkyd combinations have found innumerable uses for protecting and beautifying exterior metal objects, such as trucks, pumps, signs and others, where their inherent beauty in enamels and their excellent baking properties, combined with flexibility, toughness and color retention, have created wide markets for their usage. Their outstanding property of color retention proved valuable in the formulation of many lusterless type war finishes for such implements as trucks, jeeps, guns and other mobile equipment, subjected to extremely severe usage and exposure conditions. Various types of alkyd resins have found valuable use as a zinc chromate vehicle constituent for subsequent application as a corrosion inhibiting primer for aluminum and other light metal alloys.

Cellulosic Base Coatings—From the general group of cellulosic base materials have been developed the quickest air drying metal coatings the industrial finishing industry has ever used. Four general types comprise the general compounds nitrocellulose, ethylcellulose, cellulose acetate, and certain mixed ester groupings, any of which can be used in coatings that will provide films that dry solely by evaporation. Many millions of gallons of nitrocellulose lacquers are used annually in finishing metal articles, ranging from automobiles to glove-buttons. The speed of drying of lacquers formulated from these materials can be controlled by means of the evaporating rates of solvents used for solution. It is possible to formulate metal lacquer enamels with such fast drying characteristics, at room temperatures, that they may be buffed and polished lightly in a matter of 2 to 3 minutes, following a one-coat spray application.

Nitrocellulose, with its modifying agents, plasticizers and stabilizers is soluble in a wide range of organic solvents. It may be colored with dyes or pigments to any desired effect, or used clear, as a coat for silver, brass or copper to resist tarnish. It dries in air at room temperature, faster and more completely, than most any other industrial finish, and gives protection against ordinary environments to a degree adequate for many types of metal products. Adhesion to clean metal is good, and is bettered by suitable primers.

Integrity of the film, after exposure periods upon plated metals, has been found to be excellent. Chemical resistance is not of the maximum degree, but generally considered good against aromatic solvents and alcoholic bever-

Fig. 34 — Infrared setup for force drying clear lacquer coatings on chrome-plated vacuum cleaner parts. Courtesy Fostoria Service



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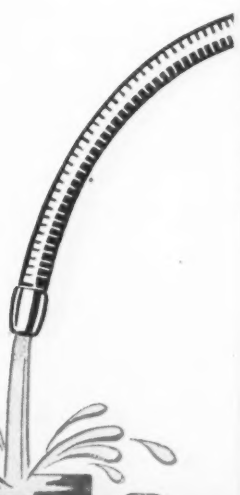

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ages, however, some attack is evident on exposure to alkalies. They are not overly stable against heat. Value of the nitrocellulose lacquers in industrial finishing is evidenced to the highest degree in applications where chemical resistance requirements are moderate, production requirements high, baking facilities undesirable or unavailable and decorative requirements of importance.[46]

High Solids Metal Lacquers—Recent advances in high solids formulation of nitrocellulose lacquers point in the direction of increasing application for these quick drying finishes in the metal coating industry. It has recently been reported by the Hercules Experiment Station[47] that a reasonable high solids lacquer, together with good durability and generally satisfactory properties, can be obtained using two parts of non-oxidizing alkyd to one part of nitrocellulose. Modifications of this combination can be made by adding small amounts of urea, or melamine resins, or not more than one part of an oxidizing-type alkyd.

Hot spraying also permits much higher than normal solids. The hot spray technique permits the reduction of the viscosity of a high-solids, high-viscosity lacquer to a workable level by heating the lacquer at the time it is sprayed. It has been found that by spraying very viscous materials, such as airplane dopes, varnishes, lacquers, paints at elevated temperatures, heavier coats can be applied without runs or sags, thereby reducing the number of applications required. It is reported that experience with materials up to 500 seconds viscosity has been satisfactory, if heated from 165 to 200°, and sprayed at pressures assuring desired atomization.[48] However, due to the varying grades and ranges of viscosity of materials on the market, definite rules regarding temperatures of the material, or spraying pressures cannot be set up with any certainty, and it is recommended that they be determined either by actual test in the equipment, or based on the recommendations of the material manufacturer. In order to cover the variations, commercial equipment available has adjustments for temperature, fluid pressure flow of material, etc.

Use of a rich solvent permits a very definite increase in solids at any given spraying viscosity, as compared to lean solvent mixtures. This principle, sometimes referred to as "high-solvency solvent", is now being used in many lacquers, and the trend in lacquer formulation is toward richer solvent mixtures, even where the extreme in high solvency is not used.[47] In addition to the actual increased solids obtained at any given viscosity, it has been found possible to spray high-solvency lacquers at higher than normal spraying viscosity, thus increasing the value that may be realized from the increase in solids. The richest solvents are low boiling compounds, like methyl acetate and methyl ethyl ketone. Using these fast evaporating solvents very heavy coats can be applied without encountering sagging or undue orange peel. Shown in Fig. 34 is an infrared setup for force drying of clean lacquer coatings on chrome-plated vacuum cleaner parts.

It is reported that recent exposure tests[47] of over 2 years duration indicate that with certain selected formulations nitrocellulose of considerably lower viscosity, such as 18 to 25 cps can be used satisfactorily with a corresponding increase in solids. This gain in solids content can be combined with that obtained either by high solvency, or hot-spray, and is related closely to choice of resin and the proportion of resin used.

Other Cellulosic Finishing Materials—Some other cellulosic materials are employed in industrial metal coating applications to a limited degree. The acetate has a high rating for moisture and light resistance, but its solvency and miscibility with modifiers are very limited. Thus, finishes made from cellulose acetate are not so widely used as those based upon nitrocellulose or ethyl cellulose. Frequently they are specialty products, higher in cost than most of the commercial coatings. However, they do possess certain definite properties. As a general rule, they dry very quickly and have no equal in the organic finish fields in resistance to ignition and burning. Other properties, other than low flammability, include great toughness or resilience, stability to light and heat, water white solution, and resistance to weak acid, alcohol, oils, and gasoline. However, as pointed out above it is difficult to obtain solution, as it is soluble in relatively few commercial solvents.

One special application of this type of coating material[49] is the use of low solvent mixtures, whereby a gel is formed. This gel becomes fluid at about 150° F, and an object immersed therein, withdrawn and cooled, retains a very heavy film, which may be equivalent to 10 or 12 sprayed coatings. One application is to aluminum steering wheels. Such a gel has been made using cellulose acetobutyrate, isopropyl alcohol and xylol.

Ethyl cellulose is available in large amounts, is soluble in almost all organic solvents, and dries like nitrocellulose, with which it is often combined in special lacquers. Chief points of superiority are its greater resistance to heat and alkali, whereas the chief defects include the above mentioned, great solubility, as well as the inherently softer film produced.

By far the most important application of ethyl cellulose is its use in hot-melt, easily strippable dip coatings employed for the protection of a number of different kinds of metal products during shipment and storage. This coating process was developed during the war to permit the shipment of delicate metal parts under rigorous climatic conditions. Mixtures of ethyl cellulose, mineral oil, waxes and resins have been made that melt at around 375° F to a reasonable thin fluid, with no volatile solvents being required. A metal object dipped in this, withdrawn and cooled, develops a coat of from 10-20 mils, incredibly resistant to salt water, humidity, alkalis and acids. The film has no adhesion, and can be readily peeled off. The coating has found its application in the storage and shipment of precision metal parts.

(*To be continued*)

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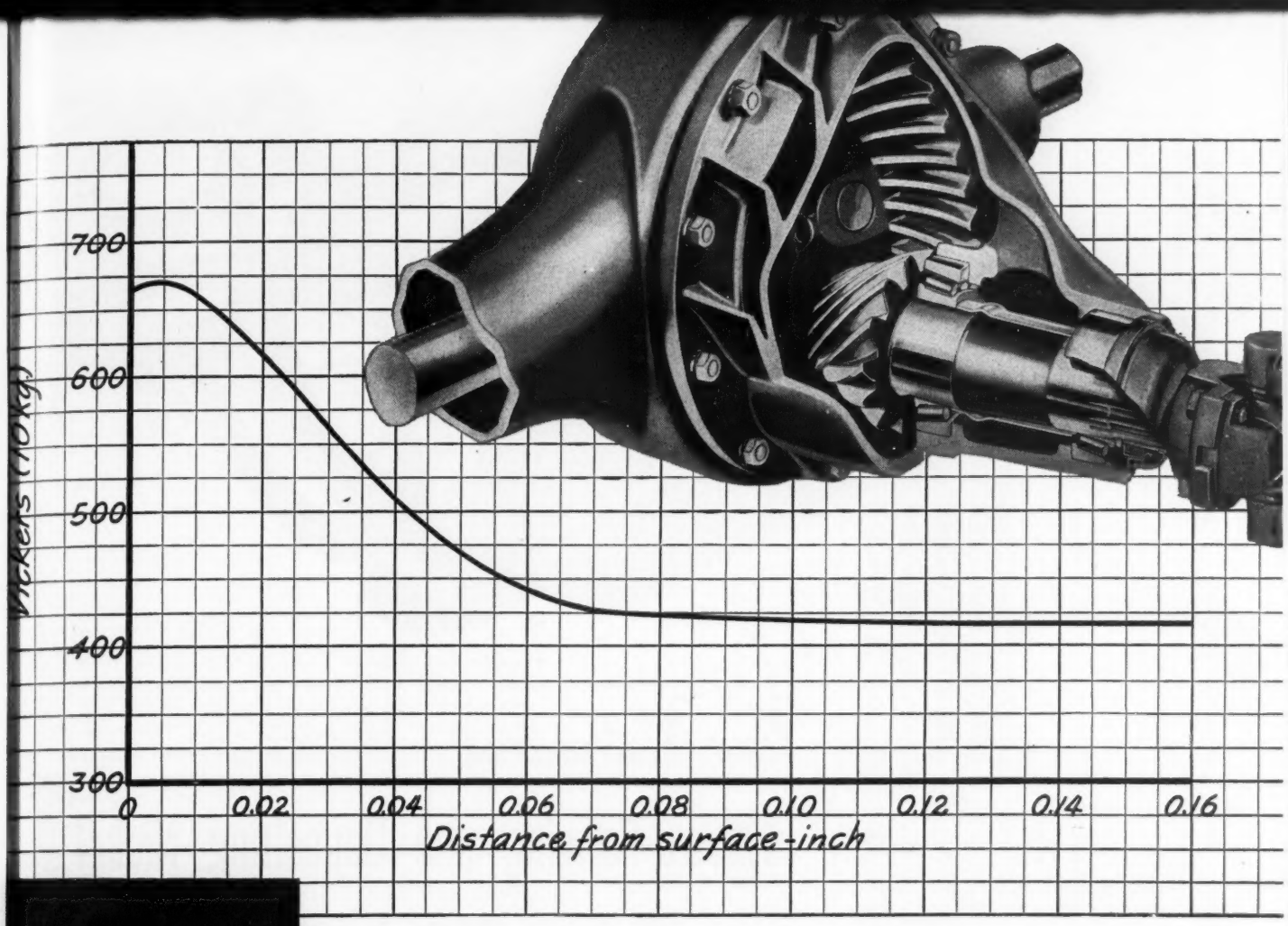
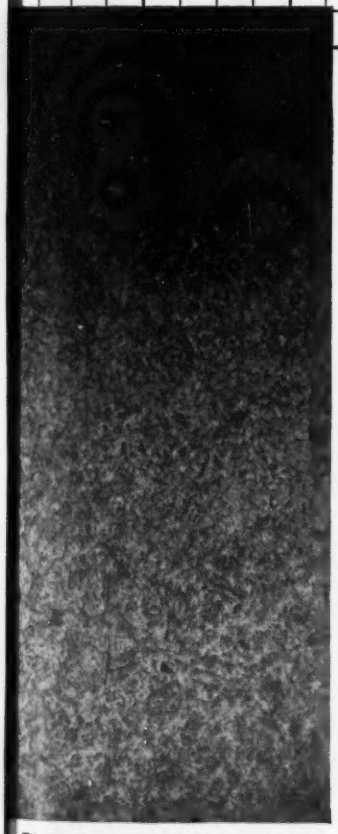
Standard Adopted for Copper Tube Manufacture

Simplified practice recommendation for copper and copper-alloy round seamless tube effective June 15 has been approved, according to announcement from National Bureau of Standards, Washington. Recommendation was proposed by Copper & Brass Research Association on behalf of manufacturers of copper tube.

Adoption of preferred sizes listed should enable tube mills to schedule longer runs with less frequent resetting of tools. Repetition of order for similar sizes should in time permit the building of stocks, and thus regularize production and facilitate distribution.





Photomicrograph (100x) and hardness penetration graph of Chromium-Vanadium A 6120 steel, with a light case (0.80–0.85% carbon) in outer .010 inch.

BONDED FOR LONGER LIFE

The secret of the outstanding strength of carburized parts made of Chromium-Vanadium A 6120 steel is revealed in the above chart. The noteworthy feature is the even slope of the curve, representing the *gradual* decrease in carbon penetration.

There is no sharp dividing line between the case and core—no shell to be shattered by shock or repeated stress. On the contrary, Chromium-Vanadium A 6120 carburizing steel is notable for the firm, well-integrated bond which results from the characteristically uniform decrease in hardness penetration from case to core.

The accompanying photomicrograph is further convincing proof of this exceptional integration or bonding.

For such vital parts as gears, cams, splines, shafts and bearings, the use of A 6120 Chromium-Vanadium carburizing steel assures superior performance and longer service life, in addition to over-all economy.

Our metallurgists will be glad to work with you on your carburizing problems.

VANADIUM CORPORATION OF AMERICA

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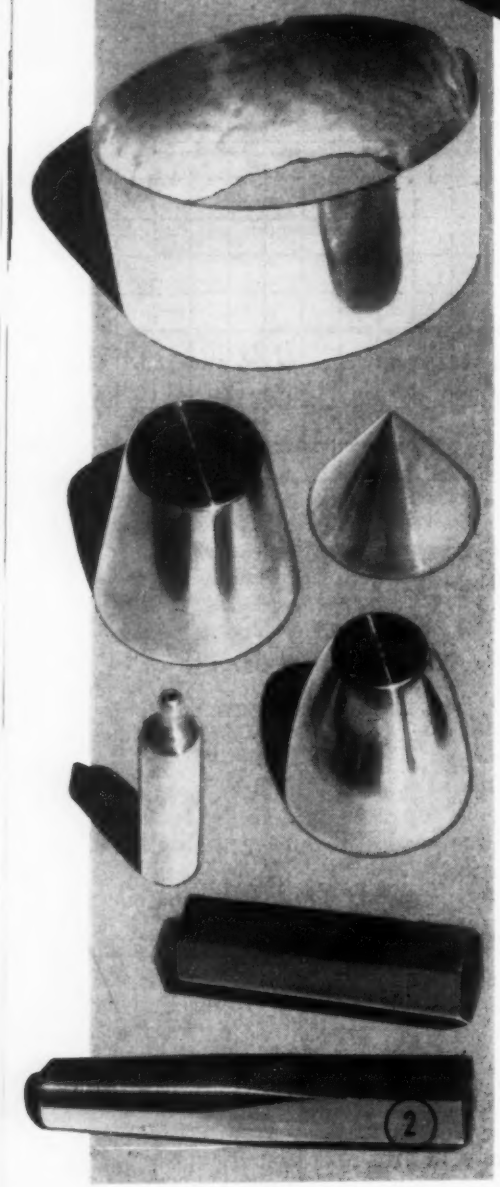


Fig. 1—Hard and strong, electrodeposited nickel is also ductile and can be deformed without damage to the deposited metal

Fig. 2—There is little limit to the shapes which can be electro-formed. Some examples are shown here

New Methods of

Electro-Forming and Depositing Nickel

. . . make possible economic production of complicated shapes and application of metal on plastic bases

TWO developments in nickel plating are now making it possible to turn out complicated shapes which have heretofore been impossible to manufacture on a production basis and to apply heavy electro deposits of nickel on plastic bases. Both are being used in a number of different fields —from the forming of fountain pen caps and barrels to the electroplating of plastic safety razor handles.

The processes as developed by the Camin Laboratories Inc., New York, are high production operations. Nickel can be applied to ground steel mandrels in electroforming or to the plastic base material in the case of plating, at the rate of 10/1000-inch in thickness an hour. As many as 40,000 finished pieces per machine in both cases have been produced in a week.

Chief advantage of both processes lies in the greater latitude they offer the designer and engineer, both for such decorative items as fountain pen parts and for a variety of industrial items—the number of which is only beginning to be explored.

Formed shapes can be controlled within tolerances as small as plus or minus 2/10,000-inch. There is little limit to the complication in shapes which can be electro-formed. Rounds, squares, recesses, undercuts, and other variations can be combined in a single design. Many of these combinations could not be produced in any other fashion—even by machining from solid stock which, where possible, would involve excessive machining costs. Where less complicated shapes are involved, the cost of electro-forming in some cases has been found to be approximately 25 per cent less than certain other types of forming, since tooling and die costs are eliminated. Variations in a specific design also can be made economically for the same reason. There are no stresses set up as is sometimes the case in die forming or similar types of fabrication, such as drawing.

Two types of mandrels are used for forming. For relatively simple shapes not involving recesses, undercuts, and the like, a polished steel mandrel is employed. This forms the inside dimension of the shape to be formed, and upon it is built up the nickel plate to the thickness desired. When the shape has been completely formed, the mandrel is easily withdrawn without damage to the plated structure. Steel mandrels are highly

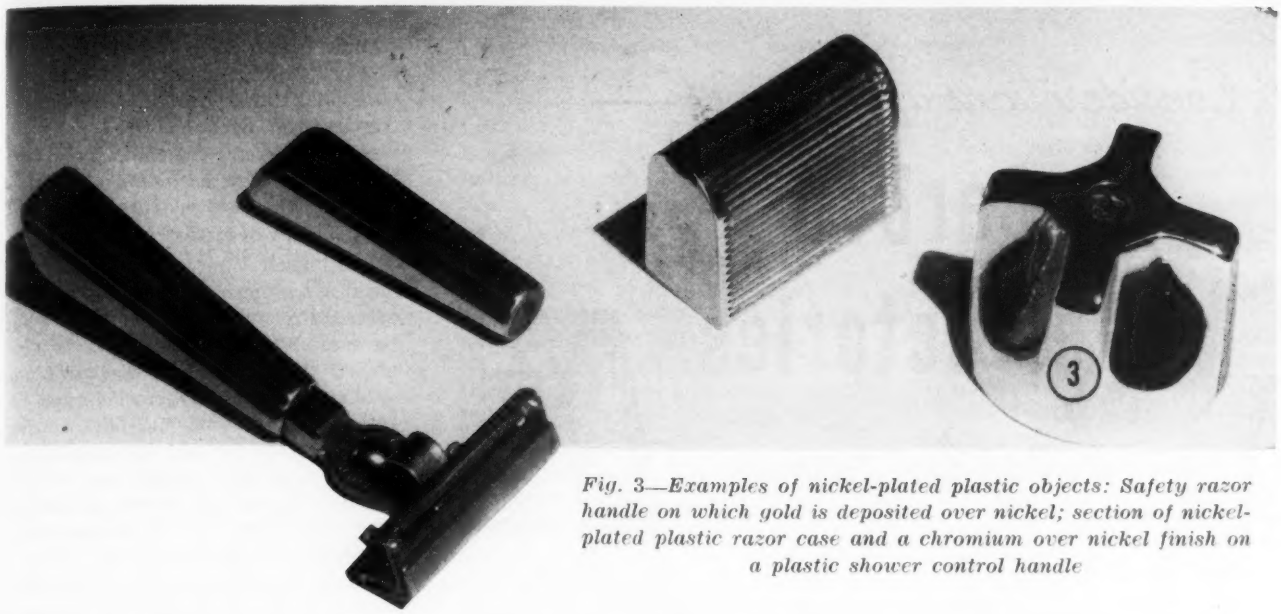


Fig. 3—Examples of nickel-plated plastic objects: Safety razor handle on which gold is deposited over nickel; section of nickel-plated plastic razor case and a chromium over nickel finish on a plastic shower control handle

polished and impart a smooth, bright surface to the inside of the formed product. This has been found of particular value in specialized applications, such as for spindle sleeves that separate the hands of a watch, and wave guides for radar.

For complicated shapes, where undercuts or other surface variations prevent the withdrawal of the mandrel, the latter is made from a low melting point alloy, such as Cerrobend, which melts at 160°F, or 52° less than the boiling point of water, used to melt out the alloy. The alloy is recovered after melting out and can be used over and over again for making other mandrels.

While electro deposits of metal have been applied to plastics in the past, it is believed that the Camin process is the first to apply by means of automatic equipment heavy, uniform deposits with excellent adhesion. In plating operations, the plastic base is first given a minute film of pure silver and then sent to the automatic plating machine. Nickel is used almost exclusively in the Camin process not only because of its appearance and mechanical properties but also because of the established value of nickel as a base for the further application of chromium or precious metals like gold, platinum or palladium.

A number of unusual applications of nickel plating on plastics are shown by some of the production jobs using the Camin process. In one case, a manufacturer of bathroom fixtures had almost 50,000 plastic shower control handles in stock. These had been produced during the war when the use of metals for such purposes was restricted. After metals became available again, the public taste—long accustomed to chromium fixtures—insisted upon a return to bright work. By applying a heavy electro deposit of nickel to these handles and then plating on a layer of chromium, the entire stock was salvaged.

As indicated, several manufacturers already are using electro-formed fountain pen caps. Several models designed for future production utilize not only caps and barrels thus formed, but combine these with plated plastic parts. It is expected that many other applications will develop for these processes since industry is just beginning to explore their possibilities for solving production problems.

Increased Consumption Results in Pipe Shortage

Problems involved in the transportation, storage, and supply of gas between the fields and the consumers makes it evident that public utilities are faced with a serious situation, stated G. Lawton Johnson, National Tube Co., Pittsburgh. It consists of a present problem of insufficient facilities to meet current obligations and a realization that the problem is rapidly increasing in severity, he told the technical section of Pacific Coast Gas Association at a recent meeting in Monterey, Calif.

Increased size of pipelines to take care of greater needs has raised the average tonnage per mile of pipe line from 86 tons in 1938 to 171.5 tons in 1946. An increasingly greater percentage of the total tonnage of pipe being used for gas lines is going into the largest sizes ranging from 20-30 inches in diameter, he continued, and during the period from 1947 to 1951 it is expected to be 96 per cent of the total.

This change in both outside diameter size and tons per mile explains in part the current inability of the steel industry to meet the pipe line demand, Mr. Johnson told the meeting. Most of the major producers today cannot accept additional pipe line commitments for delivery before 1953.

Crane Structural Members Made of Aluminum Alloys

One of the latest uses for aluminum is for the structural members of a crane being installed at the rod mill of Aluminum Co. of Canada at Arvida, Quebec. It was designed and fabricated by Dominion Bridge Co., Lachine, Quebec, and has a lifting capacity of 15 tons. The 97-foot girders are entirely fabricated of high strength aluminum alloys, extruded in the shapes of channels and angles and rolled into plates. Rivets and bolts used are also of special alloyed aluminum.

To conserve headroom, trolley rails were attached to the inside faces of girders so that trolley would not extend above their top surfaces. Total weight of the aluminum crane is 51,735 pounds. A great deal of joint experimental work had to be carried out by technicians of both companies before starting work on this unusual project with riveting techniques receiving particular attention.

Considerations in the use of—

Carbon Refractories

in the Blast Furnace

By W. S. DEBENHAM
Research and Technology Division
Carnegie-Illinois Steel Corp.
Pittsburgh

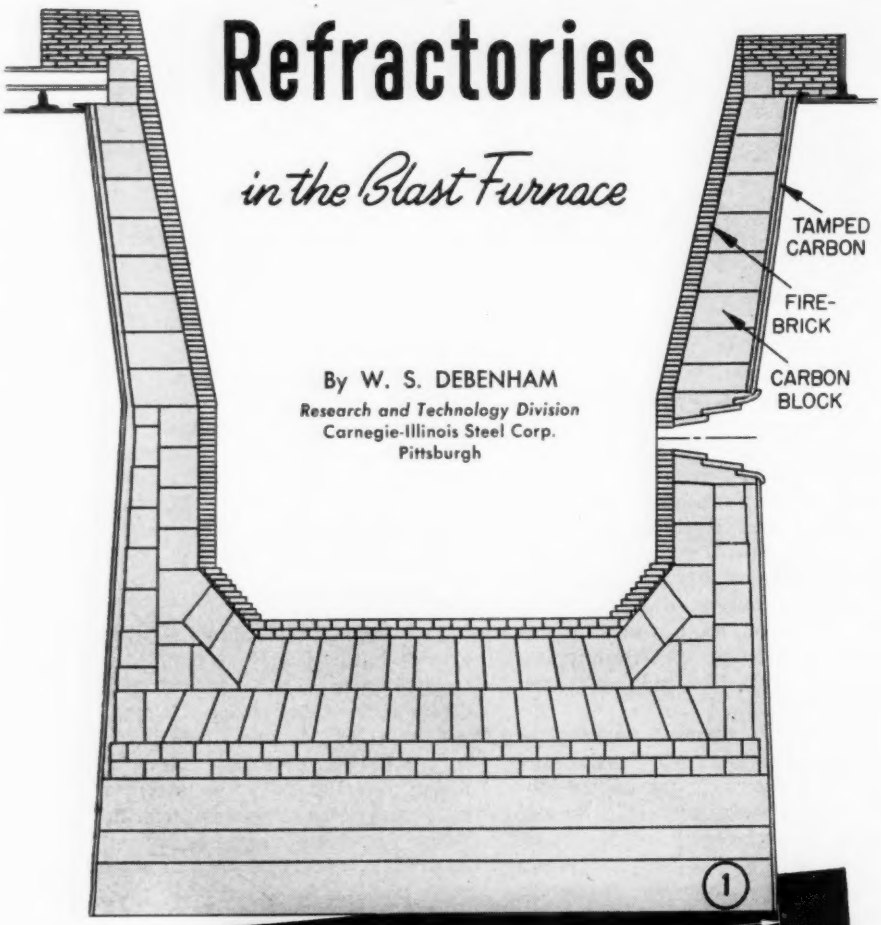


Fig. 1—Proposed English machined block design

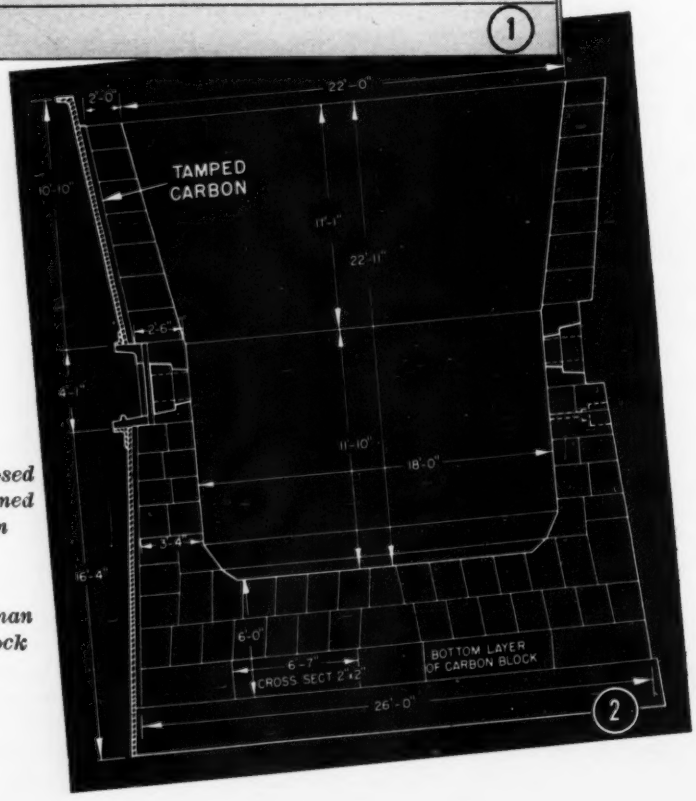


Fig. 2 — German machined block design

DURING the last four years, blast furnace operators have invested nearly $2 million in approximately 50 applications of carbon refractories. Among the questions still without final answers are the following: How should carbon be used, and what special installation procedures and precautions are necessary?

Until such time as actual service data on carbon are available we can sympathize with the operator who, harassed by hearth breakouts, is convinced that corrective measures involving superior refractories must be taken. At present, his only course is to analyze his service conditions, and with an eye on the cost, try to select from available refractories that one which will produce maximum benefits. Whether or not he initially proceeded in such a manner, the present user of carbon can gain considerable reassurance from such an analysis of his selection of a refractory, if not on its manner of application.

Advantages of Carbon—Deterioration of regular fire clay hearths is both physical and chemical. Physically, the pattern is generally as follows: Highly fluid superheated iron under pressure enters brick joints; hearth tiles are compressed or shrunk in both horizontal and vertical directions, widening joints and deepening iron penetration and bricks float out or are more readily eroded because of greater surface exposure, and the process continues.

Chemically, hearth blocks are subjected to slag attack, possible reaction with FeO formed from infiltrating air, and to reduction of silica, the latter reaction bringing about a gradual replacement of refractory by metal.

Any refractory proposed for hearth improvement must excel fireclay brick in high temperature volume stability and in resistance to chemical corrosion. Of these characteristics, volume stability is of primary importance. Hearth refractories should resist deformation indefinitely under a surface temperature of about 2900°F and a load of 25 to 90 pounds per square inch on a new hearth. Initial cost of an installation of an alumina-silica refractory meeting these requirements is sufficient reason why none have been installed, and ample explanation of the attractiveness of carbon.

While we are still lacking data on some of the high temperature properties of carbon, investigators are in good agreement that carbon will resist deformation under a 25 pound load at temperatures above 3100° F.

As to the chemical corrosion by

slag, immunity of carbon in reducing atmospheres requires little comment. There is still some question as to the possible pickup of carbon by metal. Deterioration by this means would, in all probability, be very slow. On the other hand, it has been shown that while higher alumina refractories might be superior to regular clay brick, no alumina-silica refractories will be immune to slag attack, or could long survive without the aid of water cooling.

Extent of Carbon Usage — As is true with all innovations of new and more costly refractories, economics will determine the extent to which carbon will replace brick in blast furnace linings. It is obvious from present installations that the greatest possibilities for justification are believed to lie in the hearth. Expectations are high that carbon hearths will so minimize salamander formation and the possibility of breakouts as to eliminate the old problem of whether a furnace should be relined completely or from the mantle up.

It appears that cost may not prove an insurmountable barrier to consideration of carbon as a stack refractory, provided that it can promise an order of superiority comparable to that expected in the hearth, and the relative degree of service improvement with carbon hearths and hard fired stack lining leaves sufficient incentive for further improvement of stack linings from the standpoint of balance in the over-all refractory life of the furnace.

Another important factor in stack linings is resistance to disintegration by carbon monoxide. This has been the prime mover in the present trend to hard burned fireclay brick linings. Carbon brick, being practically free of iron impurities, might be expected to show no disintegration tendencies, and such is the case. It may be expected that carbon has the greater safety factor, as tests indicate that substantially more iron will be required to disrupt a carbon brick than the 1.5-2.0 per cent of iron originally found in a fireclay brick that is prone to disintegrate.

Other considerations in evaluating carbon as a stack refractory are alkali attack and abrasion resistance. As to the former, it can be expected that carbon will be as successful as in resisting slag action in the hearth. Less has been published concerning the relative abrasion resistance of carbon and fireclay refractories, but considering the good correlations that have been found to exist in fireclay refractories between abrasion resistance and strength, it might be expected that the high uniform strength of carbon at all temperatures would make it at least equivalent to fireclay brick.

So far, the bosh has been by-passed in considering the possible extent of carbon usage. Carbon bosh linings are common in German practice, and will be employed in some contemplated British installations. Thus it would seem that there is no question as to the suitability of carbon in the bosh. The lack of such an installation to date in American practice is probably best explained in a recent paper by the statement that so little difficulty has been found with present American bosh construction that a carbon bosh might introduce construction and operating problems not now existing. Nevertheless, it is general belief in this country that sooner or later carbon bosh installations will be made.

It would appear that, aside from possible economic considerations, there are no valid objections to the use of carbon at any location in the blast furnace. Further, considering all known applications, the entire furnace lining has been, or soon will be, covered by actual installations. While we may thus be excused for speculating about an all carbon blast furnace, as we did many years ago about the all-basic open hearth furnace, it cannot be expected that the path way to its realization will be any shorter or easier.

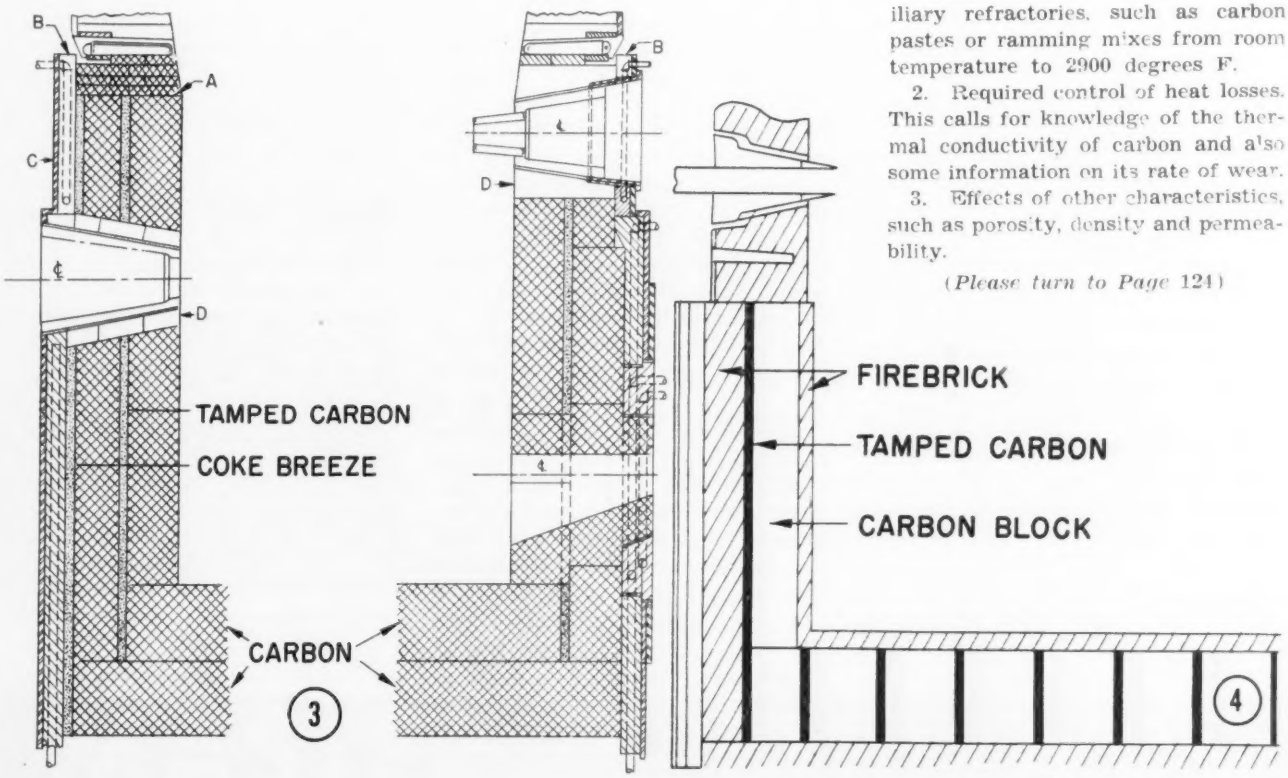
Design Considerations—Major considerations in the development of a design for carbon linings are: 1. Required compensation for volume changes. For this, data are needed on: a. Volume changes in carbon block from room temperature to 2000 degrees F., i. e., the net result of thermal expansion and any shrinkage or deformation. b. Behavior of auxiliary refractories, such as carbon pastes or ramming mixes from room temperature to 2900 degrees F.

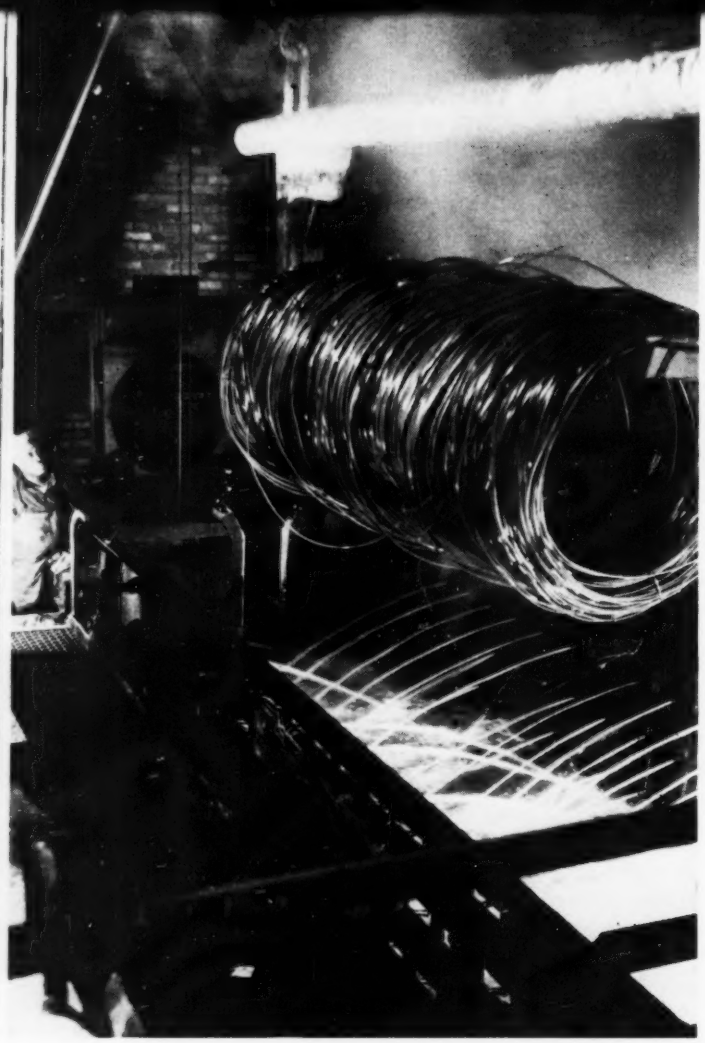
2. Required control of heat losses. This calls for knowledge of the thermal conductivity of carbon and also some information on its rate of wear.

3. Effects of other characteristics, such as porosity, density and permeability.

(*Please turn to Page* 124)

Fig. 3—Double wall design
Fig. 4—Single wall design





EXPANDS

Wire Producing

FACILITIES

Jones & Laughlin's $2 million program includes installation of 55 new wire drawing machines, a rod cleaning unit, annealing furnaces, 14 new nail machines and other plant improvements

Fig. 1—In this new rinse tank, water is sprayed on coils at 250 pounds per square inch, at the rate of 500 gallons per minute. The tank is part of a rod cleaning and lime coating unit

TO meet the demand for wire products, Jones & Laughlin Steel Corp. is presently engaged in a $2 million program of modernizing and expanding its wire-producing facilities at Aliquippa, Pa. Nearly every phase of wire production is being augmented with latest equipment which will increase considerably the plant's capacity to turn out a wide variety of manufacturer's and merchant wire products.

Last two machines in a total of 55 of the latest continuous water and air cooled wire drawing machines are being installed. These units have improved both the speed of production and the quality of the wire produced. Grouped according to the number of die holes, machines with three to four holes and up to 16 holes are included. On the latest 16 hole model to be installed, 16 gage wire is drawn down to 0.0065-inch wire at high speed.

A straight line rod cleaning unit consisting of an entry end rack, five pickling tanks, a rinse tank, a transfer rack, two lime coating tanks, and two special solution tanks, four flash baking units and a delivery rack are now in operation. Two Gantry cranes, one operating at the entry end and one at the delivery are employed to move the hooks from unit to unit. Coils of rods arrive at the entry end in 3000-pound bundles loaded on hairpin hooks. The crane lifts the loaded hooks from one process to the next. Rated capacity of this cleaning unit is approximately 220 tons of coiled rods per 8-hour turn.

Bright Wire Annealing—A new installation for controlled bright annealing of wire or rod coils, consisting of an eight-base unit with two furnaces, and a six-base unit with two furnaces, recently was placed in operation. Stacks of wire coils on the bases are covered and heated uniformly to a temperature of 1400° F by bell-type furnaces. Wire coils, inside the cover are protected by an atmospheric gas, and maintained at the necessary heat for a period of time suitable to the desired physical properties of the material.

A new patent annealing furnace and lead quench, fourth such installation in the wire mill, includes latest improvements for gas and oil firing. Plans are completed for a fifth furnace. Thirty-six high carbon rods or wire, are fed simultaneously into the new furnace, which has a capacity of 9000-pounds of rods or wire hourly, and lead quenched in a continuous operation. The furnace maintains a temperature of 2000° F, heated either by gas or by oil.

Electric Oil Tempering Unit—A new electric oil tempering unit is being installed in addition to the two now in operation. This unit is novel in that heat for treating the material is provided through the use of electric current passing through wire strands — just as electric current heats the coils in an electric toaster. Either rods or wire are heat treated, and sometimes an order is heat treated both prior to wire drawing and after drawing, depending upon the physical characteristics.

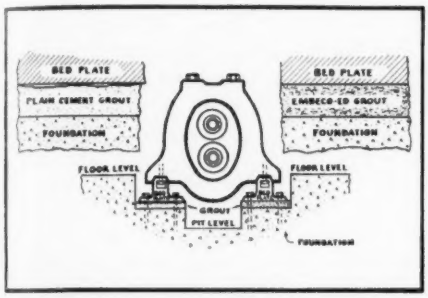
A new 36-strand Herman process galvanizing frame has been added to the one already in operation. In addition, facilities include an asbestos wipe process which is 36-strand, and a 20-strand unit for galvanizing fine wire which is either air-cooled or asbestos white, convertible to tin coating, which finishes the wire either on spools or in coils.

The Herman process consists of a rigid, vibration-free machine, with complete mechanical adjustments for applying the purest zinc obtainable

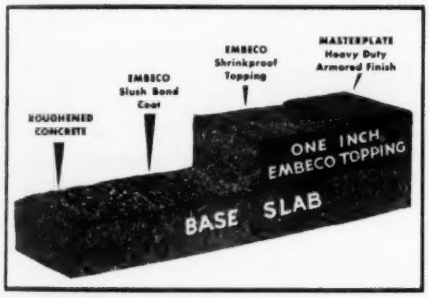
LET US MAKE A MAINTENANCE SURVEY IN YOUR PLANT

We shall be glad to make a maintenance survey in your plant, without any obligation whatsoever, and to tell you more about the products listed below.

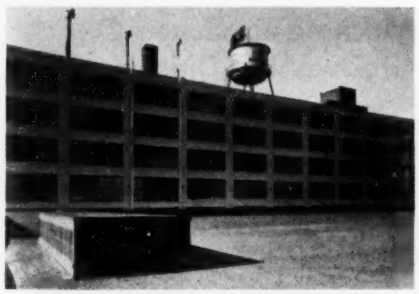
"A stitch in time saves nine" applies to maintenance work, as you know. Also, repair work done now may save many hours of lost production in the months ahead. (Easy-to-follow pictorial specifications furnished with all products.)



Cross-section above shows how slight expansion of Embeco Grout insures perfect contact with bedplate.



Masterplate makes old floors better than new by giving them an iron-concrete surface.



Ford Motor Plant, Omaha, Nebraska, after Embeco repairs were made and concrete was protected and decorated with Mastertex.

Concrete Floor in Newark, N. J. State Highway Garage Protected with Concrete Preservative.

REGROUTING — MACHINES AND EQUIPMENT

Do any of your machines weave, wobble or have excessive vibration? Then it's time to regrout them. Leading machinery and equipment manufacturers use and recommend Non-Shrink Embeco for grouting because it *counteracts shrinkage* and has the following advantages: (1) it is quick-setting — equipment can be operated after 12 hours if necessary, (2) Embeco develops high strengths — in 24 hours greater than ordinary grouts in 7 days . . . ultimately 51% greater, (3) it is oil and water resistant.

RESURFACING FLOORS

Concrete Floors need repairing? Floors, trucking aisles, loading platforms resurfaced with Masterplate wear up to 5-6 times longer than ordinary concrete. That's because Masterplate is the specially processed iron aggregate that *stays on top,* and produces a *thick,* ductile surface. Because it contains cement dispersion, up to 120 lbs. of Masterplate per 100 sq. ft. can be used. Masterplate Floors are tightly bonded to old concrete (see left). Available in 10 colors and in non-slip form, and in non-sparking, electrically conductive and static disseminating finishes.

REINTEGRATING CONCRETE

Wondering what is the best way to repair spalled and eroded concrete? Successful concrete repair requires using a material having four basic characteristics. It must (1) have similar characteristics to structure being repaired, (2) be *non-shrink,* (3) bond securely to surface to which applied, (4) permit underneath concrete to "breathe". Non-Shrink Embeco meets *all* of these requirements — that's why it's so widely used in reintegrating concrete.

PRESERVING CONCRETE FLOORS

Floors beginning to dust and pit? Master Builders' Concrete Preservative protects concrete from such causes of rapid deterioration as solutions of acids, alkalies and salts. It fills the pores with a substance which binds the surface and prevents dusting. Since it penetrates into the concrete, it does not wear off readily and requires renewal only at intervals. Floors treated with Concrete Preservative have four to six times the resistance to moisture and corrosive agents of floors treated with conventional surface treatments. Dries in 3-4 hours.

Write and we will have field representative call to make maintenance survey — without obligation, of course.

The MASTER BUILDERS Co.

CLEVELAND 3, OHIO — TORONTO, ONTARIO

Fig. 2—High carbon rods or wire are heat treated in this new gas or oil-fired patenting furnace. From the double-decker feed reels in the foreground, 36 rods are fed simultaneously into the furnace, in a continuous operation. Approximately 9000 pounds of rods or wire are treated hourly

in a bath. As the wire emerges, excess spelter can drain freely and the coating solidifies in a nonoxidizing atmosphere while water is applied to enhance the natural luster of the zinc. Such wire is readily drawn to diameters corresponding to 95 per cent reduction in area, with speeds in some of the finer sizes regularly hitting the 2000 foot per minute mark. Wrap tests made regularly show no surface peeling, but rather a hard, dense surface of comparatively high luster.

New Nail Machines—Fourteen new nail machines have been added to the nail producing facilities, and the installation of 30 more is now in progress—part of a program to install 120 machines. These units pound out 400 nails per minute—approximately the cyclic rate of fire of a .30 caliber machine gun. Output per machine is increased 25 per cent over old style machines and efficiency is increased by 15 per cent. Current capacity of the nail mill is 85,000 kegs a month, bright galvanized, blued and coated.

Under the palletization program, all nails will be stored in 100-pound kegs on 32-keg pallets, piled eight high. Lift trucks will stack and load the pallets onto freight cars for shipment.

Process Developed for Electroplating Magnesium

Electroplating of magnesium is now possible following the deposit of a thin film of zinc by a special process according to an announcement from Dow Chemical Co., Midland, Mich. Any of the plated metals such as chromium, silver, gold, copper, brass, cadmium or zinc may be electrodeposited on any commercial magnesium alloy, promoting good adhesion and continuous deposit. The bath which follows deposits an extremely adherent thin zinc film on the surface of the magnesium. From this point on, all plating is done in commercially used baths and is typical of plating a variety of finishes on any metal.

Standards Group Asks for Industry Subscriptions

Segments of commerce and industry deriving benefits from the national clearing-house functions of American Standards Association, New York, in standardization activities will be asked to subscribe their fair share of the $600,000 budget based on actual operating costs with provision for development. A group of the nations' business leaders cooperating with Howard Coonley chairman of the association's executive committee, will present the financing program.

To insure continuity of the program, participating organizations will be urged to pledge their support for a 3-year term, indicating their willingness to extend their pledges from year to year. Two publications describing the association's technical program and methods for its financing will be distributed soon.

Stainless Steel Forming Covered in New Book

Publication of a new book entitled, "Forming of Austenitic Chromium-Nickel Stainless Steels," was announced recently by International Nickel Co., New York. The volume is intended to give fabricators of metal equipment a better understanding of the adaptability of stainless steels to modern forming processes.

Bending and straight flanging, forming of curved sections and tubing, deep drawing, die forming and forming of countered-flanged parts are some of methods discussed in the book. Specific examples of forming techniques are supplemented by details of tool design and materials, lubricants, data on dimensions and consecutive steps in fabrication.

Machine Broaches Oil Grooves for Diesels

Broaching of as many as 30 internal 10-degree oil grooves for large diesel engines can be done in one pass in 3-inch bore and other sizes of SAE No. 64 bronze connecting rod piston pin bushings with a 15-ton sideplate press manufactured by Oilgear Co., Milwaukee. Production at 85 per cent efficiency is 125 finished bushings per hour. Press is also used for broaching other 10-degree helical grooves 1/32-inch wide by 1/32-inch deep.

In operation, bushing is loaded in fixture pocket and supported on a thrust bearing. As tool is pushed down to broach grooves, lead on tool causes part to rotate. When cylinder is broached, tool holder on ram is released, air cylinder lowers tool and press returns to starting position. As tool is lifted by air cylinder, detents on tool shank lift bushing out of fixture for easy removal. Fininshed part is lifted off of tool shank, press ram moves down to engage positive tool holder and then lifts tool to starting position.

PROPER JIG DESIGN

...permits its use for drilling of two different parts

By ROBERT MAWSON

WHEN designing special tools for machining holes in similar positions on two differently shaped parts, a decision must be made whether to make one or two drill jigs. Under ordinary conditions it will most often be found that the cost for making one jig will be much less than the potential cost for building two jigs.

Before making a decision on this subject, however, two factors must be analyzed: 1. Will the single tool be complicated either when making or when being used for the machining operation? 2. Will the tool require a top rated man, such as a tool maker, to change the jig after use on one part to use with the other piece to be machined?

Shown in Fig. 1, is a pressure plate at A and a pressure plate cover at B, both being made from No. 11 gage (0.1196-inch) sheet steel. Pressure plate is made from a rough blank which is turned to size, the hole bored, the edges countersunk and the three notches formed on the large bored hole.

To make the pressure plate cover, rough blank is first turned to size and center hole bored. Both pieces have three 0.155-0.157-inch holes machined in similar positions, the only difference being the countersinking of these holes in the pressure plate. Because of the rather slender construction of the part there was a tendency of the piece to warp on its face.

Drill Jig Design—In order to machine both workpieces with one jig and equalize the uneven surface of the pieces, drill jig shown in Fig. 2 was designed. It was made with a cast iron base finish machined on the surfaces indicated. A circular machinery steel block "B" is fastened on the finished surface of the base with three filister head screws and a dowel pin. Machinery steel pin "C" is fastened in the center of the block and in a hole in jig base.

Jig cover "D" is made of machinery steel and can swing on the steel pin "E" which is fitted in a machined hole in the cover and through two vertical sides of the jig base. Block "F" is also made of machinery steel and can swing on a steel pin running through the block and holes in the two ears of the jig body. Fastening screw "G" holds down the cover by entering into a machined slot so that cover can be swung back without removing set screw from tapped hole in block.

Hardened steel equalizer "H" is placed in the cover. Equalizer stem is made slightly smaller than the machined hole in the cover. Under the stem the equalizer is machined with a concave portion which fits into a mating contour provided in the cover. On the larger circular portion of the equalizer are machined three projecting feet, the ends of which rest on the workpiece "J". Equalizer is kept in the cover with a steel pin which contacts a groove machined in the stem.

Pressure Plate Positioning—Hardened steel block "K" is used to locate pressure plate in jig and is placed in the jig by being fitted over pin "C" but located for position by pin "L" which fits into a machined hole in block "B". A set screw which tightens against pin "C" holds block "K" in the jig. Tool steel liner bushings "M", each with a hole of the

(*Please turn to Page* 130)

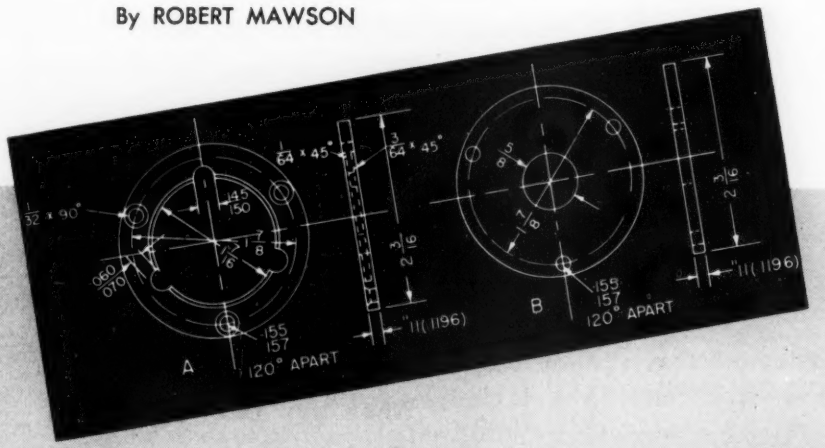
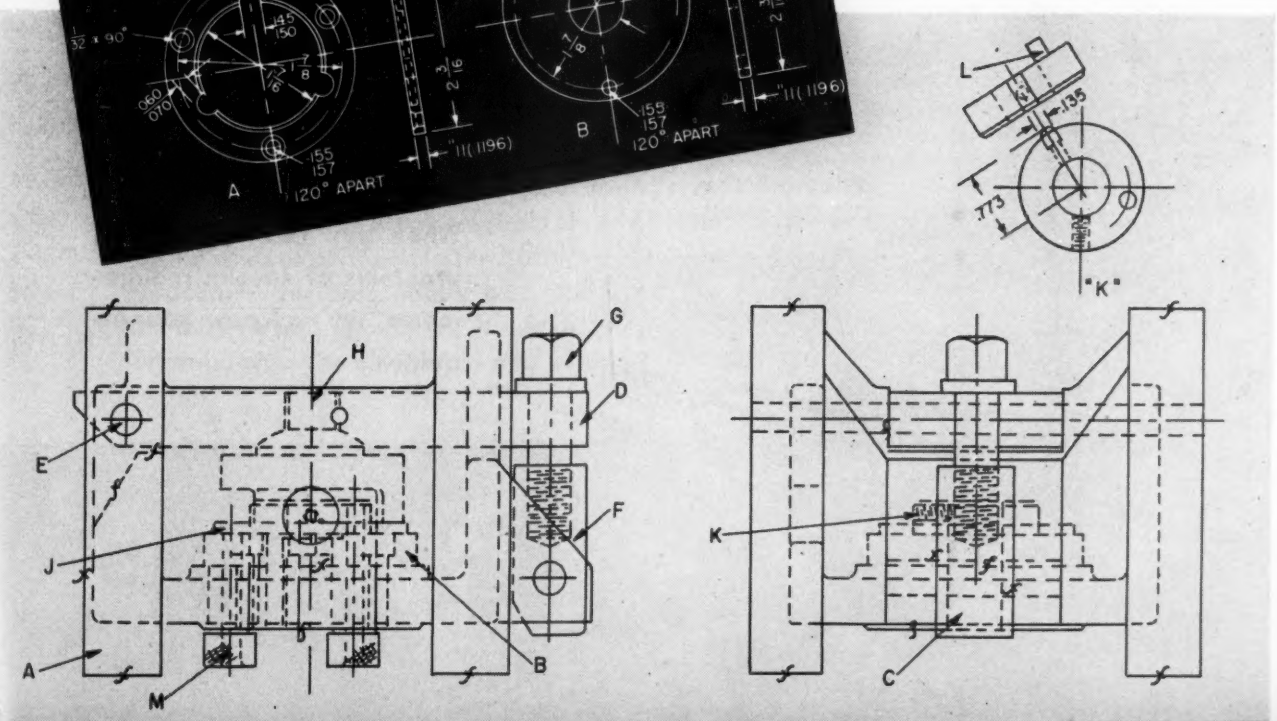


Fig. 1 *(left)—Parts drilled in jig (A) pressure plate (B) pressure plate cover*

Fig. 2 *(below)—Front and right side views of jig used in drilling operation. Block "K" used for positioning pressure plate is projected above side view to show greater detail*



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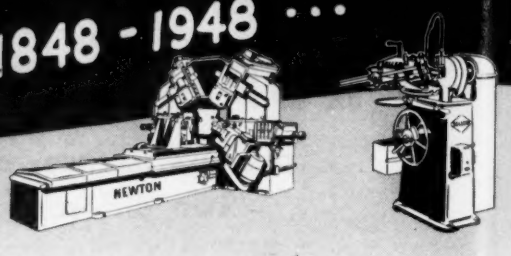

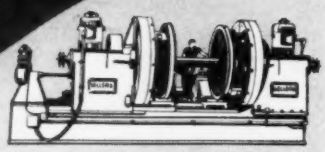

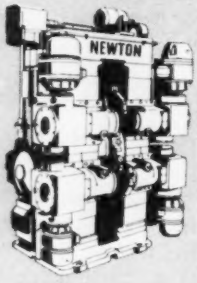

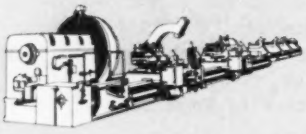

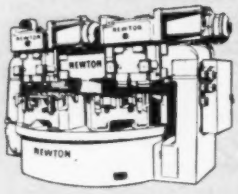

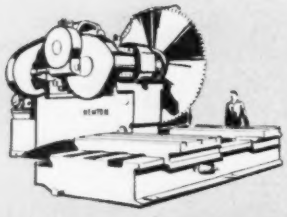

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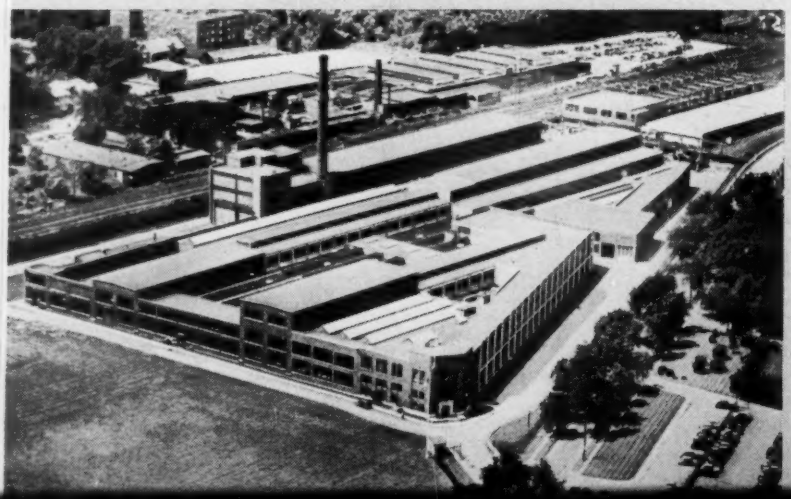

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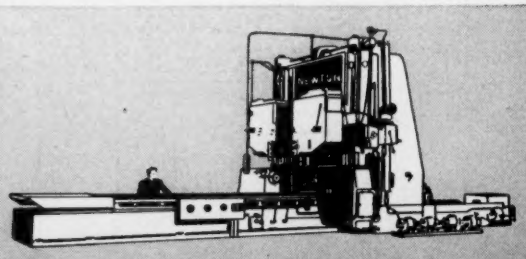

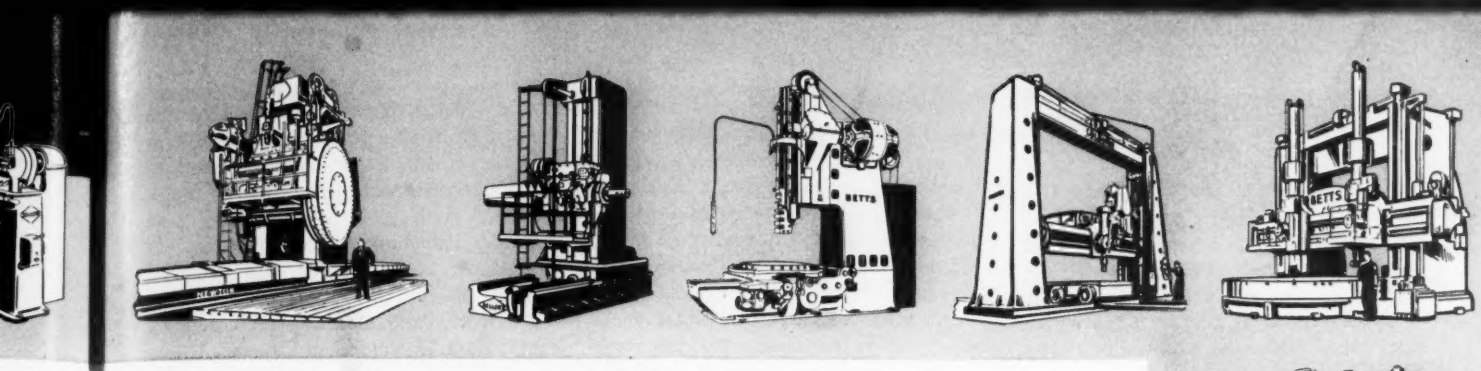

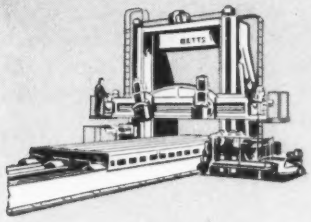

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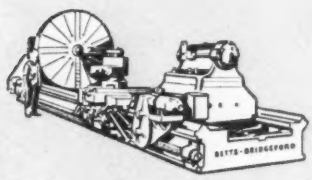
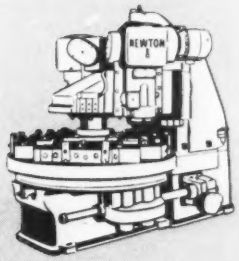


Each a recognized leader in the design and production of its particular type of machines. All are now located in Consolidated's modern plant at Rochester, New York.



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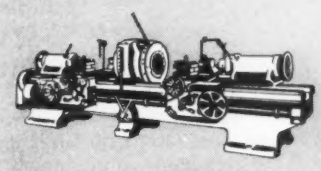
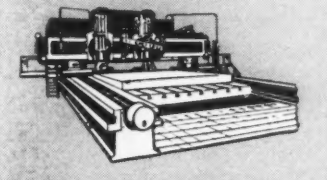
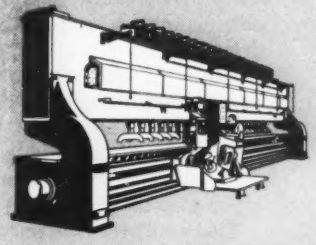


Collectively, they offer one of the world's most complete lines of heavy duty machine tools together with outstanding engineering experience in the building of machines for mass production, for automotive and tractor plants, for railroad locomotive and car shops, for bridge and structural shops, for shipyards, for steel mills and for general industry.





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Gear Lubrication

(*Concluded from Page 92*)

line of the worm shaft. Where the worm is above the gear, however, the problem may be more difficult, for the gear teeth will carry less lubricant to the worm than this latter would to the gear teeth. So a heavier, more adhesive lubricant may often be necessary, or the level of the lubricant may have to be raised considerably higher than for normal spur gear requirements.

Inasmuch as contact between a new worm and gear set is not as perfect at the start as it becomes after the worm has seated itself in the gear, the unit pressure between any two such elements will normally be greatest during the "wear-in" period. Unit pressure becomes minimum and constant after seating is completed. It will require some time for the wearing-in process of a worm and gear to become complete, depending upon the ratio and imposed load.

Scoring of Gears—When excessive wear occurs particles of bronze are worn from the gear and may adhere to the worm, in the zone of contact. The resultant comparatively rough surface will tend to score the gear and cause continuation of wear. If this can be caught in time further wear can be prevented by removing the worm and cleaning all traces of bronze from the worm threads. Under conditions of this sort the non-corrosive type of lead soap gear oil should give protection against further excessive wear.

Where the gear set is designed so that the same lubricant serves both gears and bearings the lubricant must be sufficiently fluid to follow the bearing clearances and yet viscous and adhesive enough to maintain a satisfactory film on gear teeth.

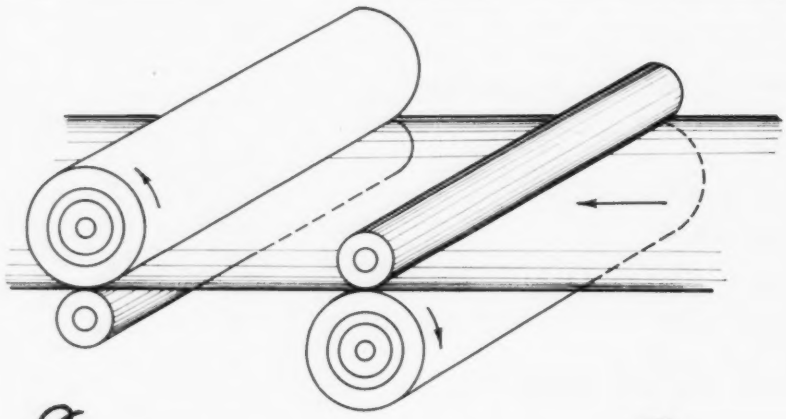
The use of antifriction bearings frequently presents another problem, wherever they are contained within the case, for their protection is as important as the lubrication of the gear teeth and the reduction of starting and running torques. This has developed another point for discussion when noncorrosive lead soap lubricants are considered.

Evidence accumulated in actual service has proved that the mild, non-corrosive lead soap gear lubricant has a definite place in worm gear lubrication whenever severe duty prevails. It is also valuable in protecting the worm and gear tooth surfaces from wear, corrosion and rusting under heavy duty conditions and has no detrimental effect on the antifriction bearings if kept clean so there is no sludge and consequent abrasive wear of bearing. The oil film is unusually persistent, resisting displacement by the shearing action of the sliding teeth. The resultant decrease in frictional heat gives added protection from fatigue pitting of the bronze and steel tooth surfaces. Also unusual protection from rusting of gears, gear case and bearings is afforded since the oil film resists displacement by water to a remarkable degree.

Figs. 2 through 8 courtesy American Gear Manufacturers Association, Pittsburgh.

—o—

Details of the latest chemical, photometric and spectrographic methods for the quantitative determination of all elements commonly found in aluminum alloys and a section on methods for sampling ingots are included in a new technical volume entitled, "Analytical Methods for Aluminum Alloys." The book was published recently by Aluminum Research Institute, Chicago, for laboratories engaged in analyzing aluminum alloys.



Electrolytic Tinning Process

Speeded by Power Brush Application

POWER driven brushes perform a vital function in the electrolytic tin plating process at the Irvin Works of the Carnegie-Illinois Steel Corp., Pittsburgh. For many years power brushes have been used extensively in the steel industry, particularly in operations involving descaling, cleaning and deburring of sheets and products. In recent years, however, power driven brushes gained wide use as a means of accelerating production.

When wartime demand for tinplate outstripped production under the former "hot-dip" method, Carnegie-Illinois examined possibilities of power driven brushes to help the speedier electrolytic process become even faster and, at the same time conserve scarce tin. Brushing was just as much a part of the electrolytic process since its adoption as any of its other phases.

There are three electrolytic tinning lines in operation around the clock at the Irvin works for strip 3-feet, 5-inches wide. Cold rolled steel strip coils pass at a high rate of speed through a sulphuric acid bath for removal of grease and annealing scale, then continue on their way through two spiral rotary brushes, as shown in the accompanying illustration, where hot water is sprayed on the strip surface. Scrubbing action of the brushes removes all loose particles of dirt and grease which may remain. A backup roll is used opposite each spiral brush to support strip as it is cleaned.

Use of the backup roll is preferred to mounting one brush directly over the other for several reasons: 1. It permits more positive and accurate adjustment of brushing pressure by firmly supporting the strip, 2. it allows brush to wear more evenly across entire brush face, and 3. it results in a more uniformly brushed surface. This latter advantage is of the utmost importance because if strip surface is not uniformly cleaned of all grease and dirt, a porous coataing of tin results.

Spiral type rotary brushes made by Osborn Mfg. Co., Cleveland, of 12-inch outside diameter and filled with tampico fiber, are used exclusively for this process. Advantage of the spiral winding is that it permits no streaking such as might be caused by sectional type brushes. Even distribution of the tampico fill material is another advantage.

Alloy Steel has assumed such a tremendous role of such primary importance in so many essential industries, that the American Society for Metals welcomes this opportunity to dedicate as the theme of the 30th National Metal Congress & Exposition — "A Salute to Alloy Steel".

Alloy Steel is a truly American achievement. Since the tremendous improvement in Alloy Steel during the past 30 years has paralleled the growth and importance of the American Society for Metals, it is fitting that the 20,000 members of this society, who represent the Alloy Steel producing and consuming industries, should sponsor this well-deserved tribute.

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A vast panorama of progress in Alloy Steel production and fabrication will be presented at the Philadelphia Metal Congress & Exposition. A brilliant program of over 100 stimulating and helpful technical papers on all aspects of Alloy Steel will be presented by recognized authorities at the Metal Congress.

DISTINGUISHED SERVICE AWARDS

An outstanding feature of this diamond jubilee of Alloy Steel will be the presentation of "Distinguished Service Awards" to individuals who, by research, improved manufacturing processes, experimentation, new applications and various other means, have contributed to the improvement, development and acceptance of Alloy Steel. Nominations for these awards will come from the entire metal industry and will be judged by a special Awards Committee of top-ranking executives.

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Along with the distinguished displays of over 350 manufacturers and processors of metals and metal products will be a spectacular dramatization of the 75 years progress in Alloy Steel. Occupying the entire stage of Convention Hall, this exhibit will give visitors to the Exposition the complete story of Alloy Steel.

From all over the nation, metal men are making plans to come to Philadelphia for this great jubilee. Don't miss it—make your arrangements TODAY!

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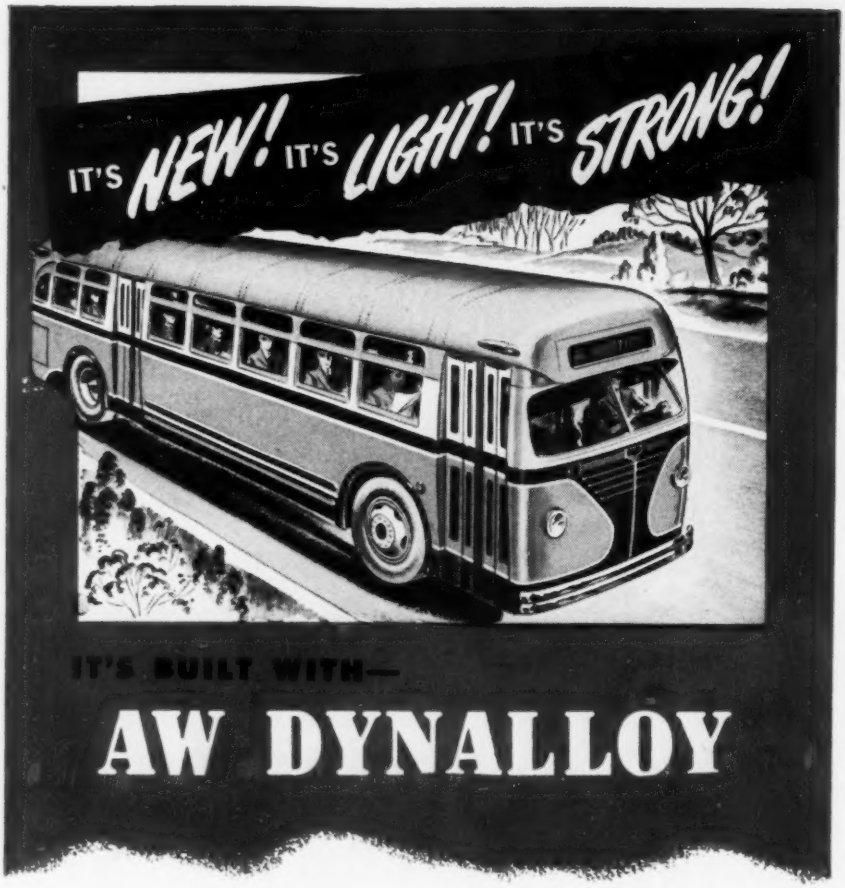

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Carbon Refractories

(*Continued from Page* 113)

We can be confident that the linear expansion of carbon block is comparatively low, and increases fairly uniformly with temperature to a value of approximately 0.8 per cent at 2900 degrees F.

Shrinkage and Deformation Under Load—All investigators agree that carbon block will show no evidence of deformation under a load of at least 25 pounds per square inch below 3100 degrees F. Carbonaceous cements and ramming mixes lack the stability of fired carbon blocks and thus offer some compensation for block expansion. Cement used for tight joints sets at approximately 600 degrees F, and will show a shrinkage of about 2 per cent between setting and operating temperatures. Ramming mixes used for filling wide bottom joints remain plastic or compressible to about 1000 degrees F, and like the cement, will shrink an additional 2 per cent in reaching operating temperatures.

Most inconclusive of all data on carbon properties are those concerning heat transfer. This is not surprising, as not only does the conductivity vary greatly with the starting materials and porosity, but the determination of accurate values is quite difficult, owing to precautions necessary to prevent carbon oxidation and contamination of thermocouples at temperatures above 650 degrees F. In spite of this, published data of two American carbon suppliers are in good agreement.

Porosity of carbon block will vary from 19 per cent to about 25 per cent with a density of from 94 to 100 pounds per cubic foot. While the porosity is thus somewhat higher than fireclay blast furnace refractories, and it is still desirable to keep it to a minimum, the volume stability of carbon does eliminate a chief objection of high porosity found in fireclay hearth block, in which the porosity directly governs the final volume reduction in service.

Present Designs — Considering restrictions that the foregoing characteristics might impose on carbon design, a surprising number of variants are found in the following three established practices: Machined block design which has been employed only in Europe. Aside from the important fact that such furnaces performed satisfactorily, no information on the behavior of these hearths is available. Double wall design or minor variants of it, is the one most prevalent in this country. Compensation

for expansion is provided both by the 2-inch paste joints between blocks and by the three to four inches of compressible, tarred coke breeze between the outer ring of carbon block and the cooling staves. Single wall design is characterized by a single, heavy inner lining of carbon backed up by fireclay brick. In allowance for expansion, this design is intermediate between the two previously described.

To complete the picture on carbon applications, mention should be made of the simple carbon bottom pads having firebrick side walls which constituted the earliest installations abroad, and were repeated here.

Design Possibilities — One of the first conclusions to be reached is that required expansion relief for carbon is considerably less than has been provided in some installations. Overemphasis on this feature of construction has naturally resulted from concern over the unyielding nature of carbon at high temperatures. Because of the lack of accurate conductivity date, precise calculations cannot be made of the net expansion in installations combining carbon block and ramming mixes.

As no expansion difficulties have been reported in any of the three principal designs, it would appear that the granular fill employed in only the double wall construction is not essential to take up the residual expansion. The apparent ability of rammed carbon to compete with coke breeze in this respect may be due to the fact that near the shell, temperatures may be sufficiently low to keep the rammed carbon in a plastic condition until most of the expansion has occurred.

Theoretically, 9 inches of firebrick would be as effective an insulator as 3 inches of coke breeze. Actually, this amount of firebrick can reasonably be expected to be more effective, as the thickness of the fireclay linings used in comparing heat losses with carbon hearths is never accurately known, and, from experience, it would not be surprising if some fireclay hearth walls showing half the heat loss of carbon hearths were less than half their original thickness. Limitations on the thickness of fireclay brick for insulation is the increasing interfacial temperature, which should not exceed that of initial deformation of the brick.

Disintegration Testing — Carbon monoxide for disintegration tests is often made by passing CO_2 over hot carbon, and, in view of the permeability of carbon and the furnace pressure, it can be expected that the brick will be subjected to an effective dis-

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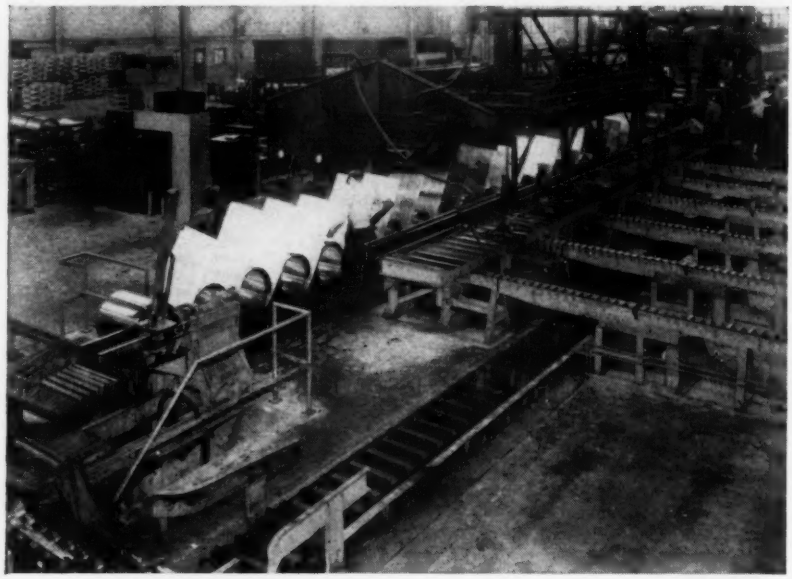

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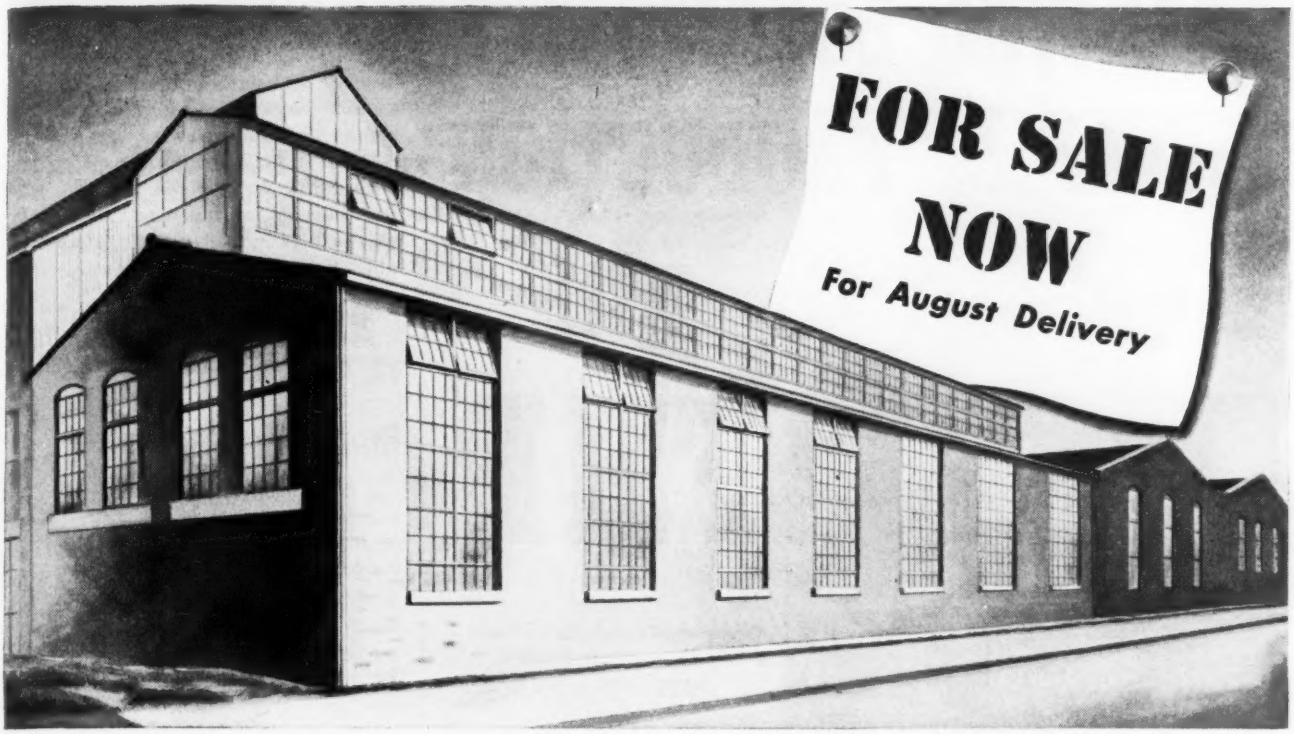
integrating gas. Both from the standpoint of high deformation temperatures and disintegration resistance, a hard fired brick is indicated. With such brick a thickness of 13½ inches could safely be used.

Economical use of carbon with a fireclay brick back-up demands the minimum thickness of lining consistent with structural stability. Structural stability, in turn, is dependent on the rate of wear, furnace size, and on behavior of underlying firebrick in the hearth bottom. Assuming a negligible rate of wear, excessive carbon thickness is unnecessary, and a single layer wall 12 to 15 inches thick, separated from the firebrick by a cushioning and sealing of rammed carbon should prove satisfactory. For the bottom, it is necessary that the carbon be thick enough to maintain the underlying course of firebrick at a temperature at which it will not deform. It would seem advisable to use not less than the 30 inches which represents the minimum carbon bottom thickness so far employed in this country. Whether this thickness was applied in one or two layers would seem relatively unimportant.

Single Carbon Wall Offers Merit— If, on the other hand, it is assumed that carbon will gradually erode and the idea of a permanent lining must be abandoned, the single thin carbon wall may still have merit. For example, hearth wall breakouts with fireclay brick usually occur early in the campaign, before equilibrium conditions between firebrick and slag are satisfactorily established; hence, if the carbon wall is eventually lost, it might be expected that long trouble-free service could be obtained on the fireclay backup wall. With a double carbon wall, unless wear was uniform, the inner ring could conceivably be lost prematurely by a break in the key at any point. In that event, heat losses for the balance of the campaign on the outer wall would exceed those of the single wall construction, and the remaining carbon would probably lack the protective coating generally formed on fireclay walls. Accordingly, if greater carbon wall thickness were desired, increasing the thickness of a single layer would seem preferable to adopting a double layer construction. As to the bottom thickness of carbon, this might sensibly be increased up to the 45-inch thickness commonly employed, which necessitates double layer construction. However, if this exceeds our strict carbon budget, a substantial safety factor still exists with a 30-inch single course of carbon laid over hard burned super duty brick.

The purely American innovation



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Located in Cicero, Illinois, in suburban Chicago, this complete steel forging plant is practically "next door" to ample sources of supply, and is right in the middle of a huge industrial market area. Close at hand are manufacturers of farm equipment, aircraft, industrial machinery, tractors and trucks, railroad equipment, automotive equipment, and fabricators of hundreds of other industrial items . . . all of whom have need for steel forgings. A number of these customer neighbors already know the reputation of this plant for precision forgings and have been steady buyers.

Plant Now in Operation

This plant is for sale as a whole. It is now in operation and has an outstanding production record. Purchaser of this plant can, by an economic additional investment, make it completely self-sufficient. It consists of eight buildings on an 8¾-acre site, together with all machinery and equipment. Total floor space is approximately 80,000 sq. ft. Rail, highway and water transportation facilities are excellent. All utilities are available through local services.

The Government thinks so well of this plant that it is offered for sale, subject to provisions for the national security. This means that the Federal Government retains dormant rights to utilize the facilities under Government contract. In the event that this dormant right is exercised, the Government will consider the qualifications of the buyer to carry out such contracts.

Sealed Proposals Invited

Sealed proposals are now invited for the purchase of this property as a whole. Bids will be received by the War Assets Administration, Office of Real Property Disposal, Washington 25, D. C., until July 28, at 2:00 P.M., E.S.T. (3:00 P.M., E.D.S.T.). At that time, all bids will be publicly opened and read at the Office of Real Property Disposal in Washington.

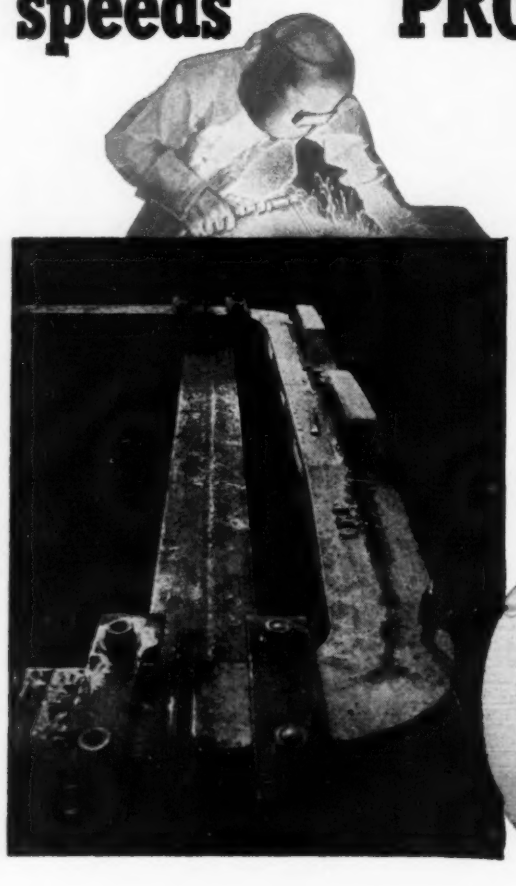
Write at once, to the address below, for a detailed description of this property and for your copy of the Invitation to Bid which will be helpful in submitting your proposal.

This advertisement is not a basis for negotiation. War Assets Administration reserves the right to reject any or all bids. Transfer of title will be subject to Executive Order 9908 relative to fissionable materials.

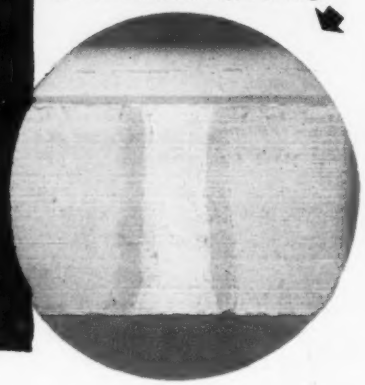
WAR ASSETS ADMINISTRATION
OFFICE OF REAL PROPERTY DISPOSAL
WASHINGTON 25, D. C.

1606-T

BALDWIN LOCOMOTIVE speeds PRODUCTION with FHP



Cross section of straight gap weld made with FHP in Locomotive mud ring.



● Using the correct M & T electrode . . . plus a wealth of welding "know-how" is the combination that consistently produces high speed, high quality fabrications at low cost in the Eddystone plant of the Baldwin Locomotive Works.

An excellent example is their production line manufacture of water-space frames . . . or mud rings as they are more frequently termed. These frames, used in locomotive boiler assemblies range from 4′ x 5′ up to 10′ x 22′ in size and are made from bars 4″ to 8″ in width and 3″ to 5″ in thickness. All welding is done in straight-sided gaps with 5/16″ Murex Type FHP electrodes at approximately 600 amperes . . . an overloading of current which few electrodes will withstand. Results, however, are extremely high speed operation with no sacrifice whatever in welding quality . . . a neat trick but daily routine at Baldwin where welding ingenuity and M & T electrodes combine to provide welding speed, quality and economy.

Want literature covering the entire M & T line? Write today.

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MUREX WELDING ELECTRODES
M&T ELECTRODES and GAS RODS
M&T WELDING ACCESSORIES

of the all-carbon tap hole is proving successful, and is eliminating the controversy over the joint use of fireclay and carbon brick in this location. Again, the problem of the height to which carbon must be carried up the side walls for safety has been fairly well solved, and the fact that carbon continues to rise toward the bosh is indicative of the interest now being shown in the economic limit to its use.

Condensation of paper presented before American Iron and Steel Institute, New York, May 26, 1948.

Proper Jig Design

(*Concluded from Page* 119)

correct size to guide drill, are placed in holes machined in lower wall of jig base.

When machining pressure plate, block "K" is placed in jig by locating with pin "L" and is held in the jig by tightening set screw against the pin. Workpiece to be drilled is then placed over the block and is located by the pin in the block fitting into one of the notches of the large bored hole.

Cover is then swung down into machining position and tightened with holding screw. Downward pressure exerted brings feet of the equalizer in contact with the workpiece. Construction of the equalizer rectifies distorted surfaces of the workpiece and forces it down securely onto surface of the block "B".

Drilling and Countersinking—Drill jig is then turned over so that upper machined legs will rest on table of drill press. Drill is guided in the slip bushings in the conventional manner and the three holes are drilled. Slip bushings are removed from the jig and the holes countersunk. Desired depth of cut is obtained by using a stop collar on tool.

To remove pressure plate the jig is returned to original position, holding screw is loosened, and cover is moved back. Three finger slots machined in the base "B" enable the workpiece to be lifted out easily.

When drilling holes in pressure plate cover, block "K" is removed from jig. A hole provided in the forward vertical wall affords ready access to holding screw in the block. Pressure plate cover is then located on pin "C", cover is fastened and jig is turned over to its drilling position.

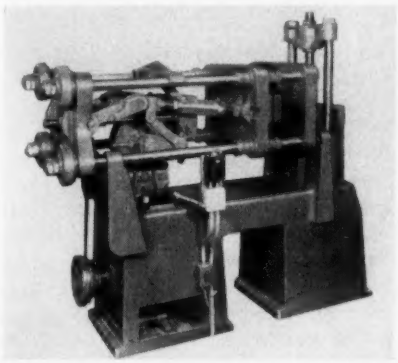
—o—

Recently published by Engineering Experiment Station, University of Illinois, is a bulletin entitled "Rate of Propagation of Fatigue Cracks in 12 x ¾-inch Steel Plates with Severe Geometrical Stress Raisers".

New Products and Equipment

Die Casting Machine

Designed for zinc, tin or lead production, the new hydraulic model No. 32 HZ Workhorse die casting machine, built by Light Metal Machinery Inc., 736 Penton Bldg., Cleveland 13, O., has a shot capacity of 32 ounces. Top speed of the machine is



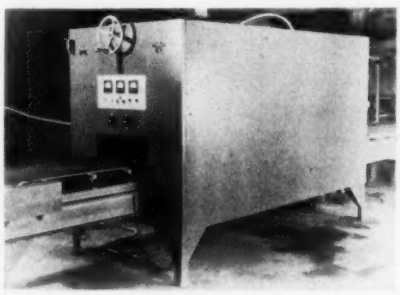
720 shots per hour. Other speeds are 520, 340 and 240 shots per hour. Casting cycle is completely automatic.

Die movement, shot and ejection follow smoothly in continuously repetitive cycles. Once operator sets the machine's speed, no human element is involved. Higher output enables use of single cavity dies, thereby reducing die costs. It is furnished with Vickers hydraulic control unit.

Check No. 1 on Reply Card for more Details

Core Baking Tunnel

Induction Heating Corp., 181 Wythe Ave., Brooklyn 11, N. Y., is announcing its model M-800A Ther-Monic electronic core baking tunnel which, with an average baking cycle



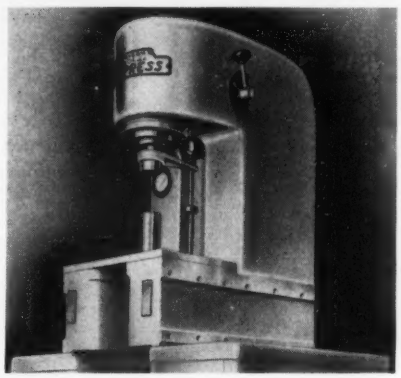
of only a few minutes, has a capacity of 650 pounds of cores per hour. Electronic heating times are in the order of 20 seconds to a few minutes. After the baking cycle, the core plate emerging from the tunnel may go directly onto the inspection table.

It is possible to readily adjust and control the green strength, hot strength, hardness, collapsibility and other characteristics of the cores, overcoming the problems of hot tearing, burning in and poor finish of the casting. Using resin binders, gassing is reduced to the point where blow holes are no longer a problem. The core baking tunnel is of the continuous conveyor type, self contained and measuring 16 feet 9 inches long, 4 feet 4 inches wide and 6 feet 8 inches high.

Check No. 2 on Reply Card for more Details

Hydraulic Press

Speeds three times faster than standard models are offered by the 4-ton capacity Rocket Multipress with HydrOilic power, made by Denison Engineering Co., 1160 Dublin Rd., Columbus 16, O. Three design



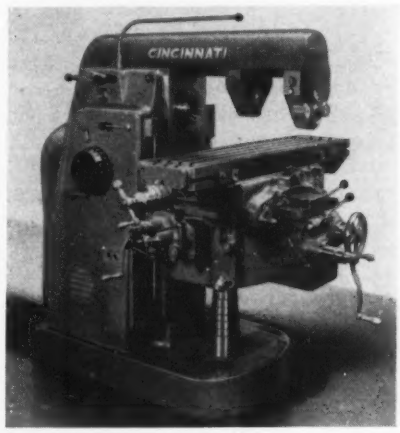
changes, one in the control system, one in the operating component and the other in the power system, result in speeds of 1100 inches per minute approach speed, 450 inches per minute pressing speed and 750 inches per minute return speed.

Check No. 3 on Reply Card for more Details

Milling Machine

Cincinnati Milling Machine Co., Cincinnati 9, O., is offering a dial type milling machine, built in medium and high speed ranges, plain, universal and vertical styles, and size No. 2, 3 and 4 for each, 18 machines in all. Machine itself performs the actual work of shifting gears. Plastic speed and feed dials are centered with each other. A spindle speed calculator, also on the same center, eliminates guesswork in selecting the best cutter speed. Gear shifting arrangement is desirable where rough and finish cut, or a variety of cutters, are required while the parts remain in the fixtures.

High speed machines have 21 spindle speeds from 20 to 1500 revolutions per minute for the No. 2 size and 18 to 1300 for the No. 3 and 4 sizes. There are 24 feeds from 5/16 to 60 inches per minute. Medium speed machines have a slightly smaller selection of speeds and feeds and upper limits are one-third less. All ma-

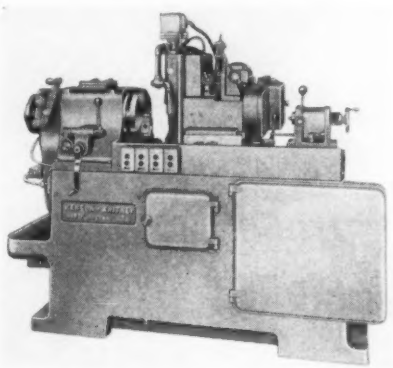


chines are equipped with built-in vibration damping units. Standard equipment includes motors and controls and vertical machines have power feed and rapid traverse to the vertical head and a 4-position, dial turret stop.

Check No. 4 on Reply Card for more Details

Thread Grinder

Feature of the thread grinder introduced by Hanson-Whitney Machine Co., Hartford 2, Conn., is a master roll to maintain the life of a crusher roll, which in turn crush-forms the grinding wheel with a wide variety of multithread patterns which



are then transferred to the work. All operations of the machine, with the exception of work loading, are automatically controlled. Threading is accurate and threads are properly mated to close limits.

Maximum thread is 2 inches in length in $1\frac{1}{16}$-revolutions of the work.

Purpose of the master roll is to provide the means to transfer the original thread pattern to the crusher roll, when the crusher roll pattern has been worn down by repeated crushing of the wheel. Thus the master roll maintains production. Hard heat treated materials may be threaded and formed.

Check No. 5 on Reply Card for more Details

Spray Booth

Water-wash spray booth, built by Despatch Oven Co., Minneapolis 1, Minn., has a front water curtain which slopes only slightly to permit 56 gallons of water per minute to pass down each foot of the length of the curtain without splashing. This is one of at least five washes the air gets before it is exhausted. The header supplying the water flow and the two others inside the eliminator section are individually controlled so that volume can be varied to meet demands.

Water volume is far greater than that required to keep paint from building up on face of the curtain. Powerful axial flow fans provide a minimum of 150 cubic feet per minute per square foot face velocity of air for removal of over spray. The settling tank of the booth allows the washed out paint to accumulate for reclaiming. No paint goes back through system to clog the pump or orifices in the headers.

Check No. 6 on Reply Card for more Details

Tilt Truck Attachment

A rigid, adjustable support for 2-wheeled hand trucks, the universal tilt truck attachment developed by Melooz Mfg. Co., 4730 Avalon Blvd.,

Los Angeles 11, Calif., allows most standard trucks to be converted into a perfectly balanced 3-wheeled truck which carries the entire load of the article being moved. A telescoping tube, extending upward from the platform to the top crosspiece of the truck, is adjustable so that truck can be tilted and locked at any angle.

Leverage plate extends over third wheel, bringing the trucker away from and out from under the load when breaking. The leverage principle multiplies the strength of the trucker. The third wheel provides free steering in any direction.

Check No. 7 on Reply Card for more Details

Rocker Arm Welders

Progressive Welder Co., 3050 East Outer Drive, Detroit 12, Mich., is announcing an improved line of standard air operated rocker arm welders in both 30 and 50 kilovolt-ampere capacities, with throat depths ranging from 18 to 36 inches for each capacity. Front of machine which carries the welding stresses is of heavy reinforced welded steel. Rear part of machine which serves mainly as an enclosure, is provided with removable panels.

Three independent water cooling circuits are provided for transformer, lower arm and upper arm. Interchangeable within the machine is an optional single operating cylinder or

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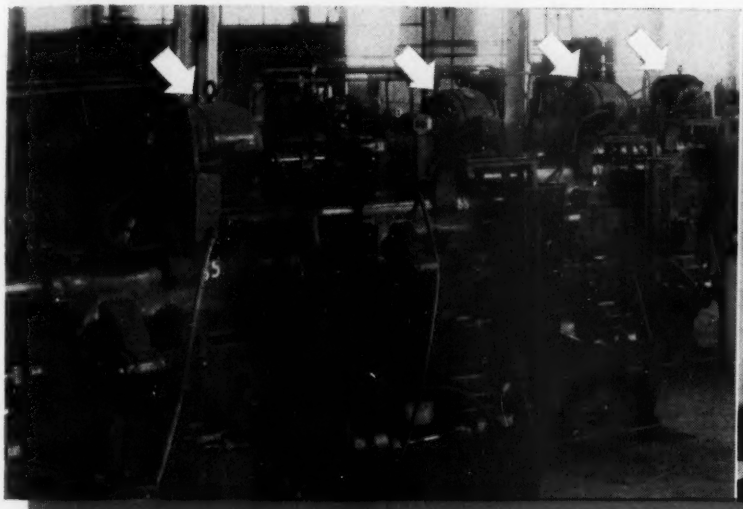
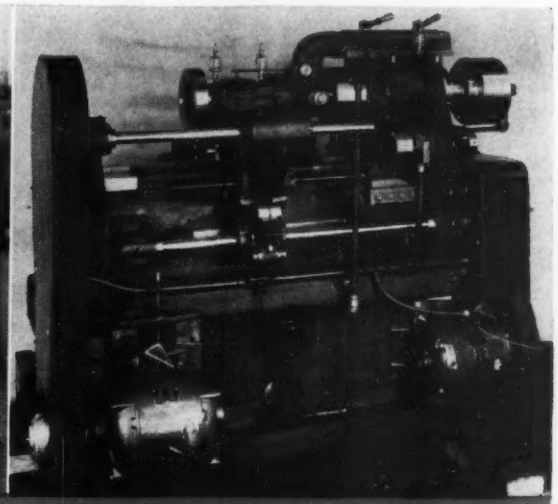
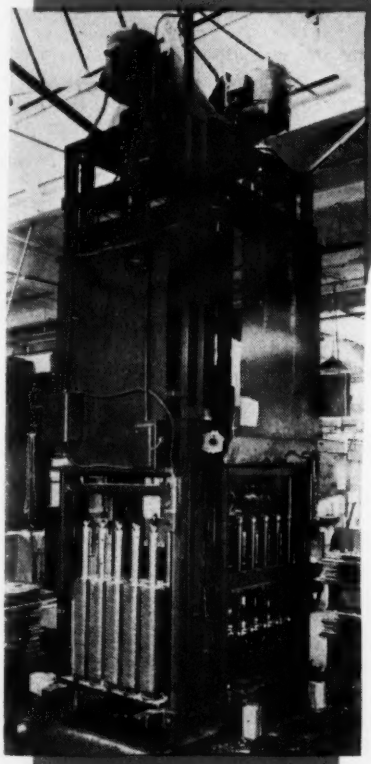


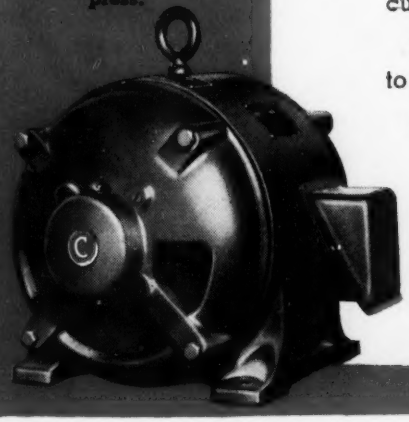
For High Production — four 5 horsepower Squirrel Cage motors operate milling machines



Accurate Thread Cutting—One horsepower and a two horsepower Squirrel Cage motor drive this thread cutting lathe



Three 7½ HP "Frequent Reversing" (rated 10 times per minute) Squirrel Cage motors drive an assembly press.



Century

Engineered Motor Applications

Accurately Meet Your Load Requirements— Assure Long Motor Life— Dependable Service

Century builds properly engineered motors to meet the requirements of all popular machine tool and other industrial equipment.

They are ruggedly constructed to assure a long life of continuous, economical service—built with the stamina to keep your production machinery in operation day after day.

Century motors have the following advantages—unusual freedom from mechanical and electrical vibration, rigid frame and end bracket construction, adequate ventilation system, accurate machining.

Century builds a wide range of motor types, in sizes from 1/6 to 400 horsepower to assure top performance.

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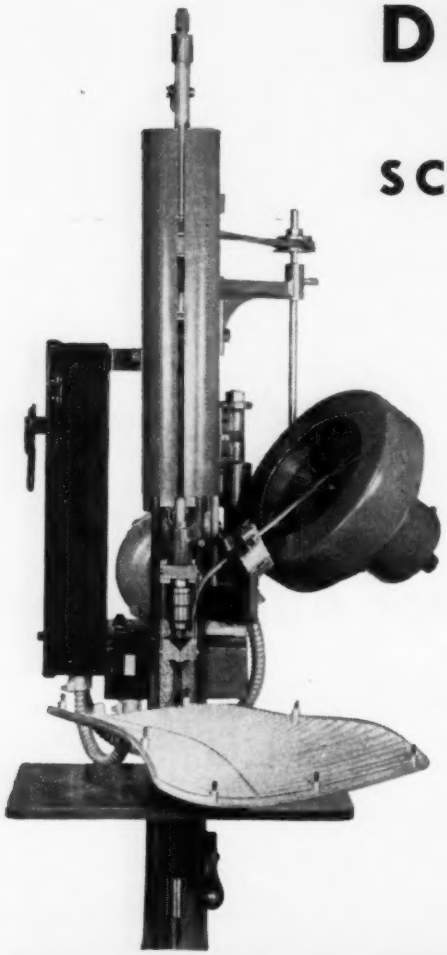
Century C MOTORS

A MODERN WAY OF DRIVING STUDS

by using

DETROIT *—Power—* SCREWDRIVERS



Hopper-feeding eliminates the handling of studs . . . . Machine is equipped with Titan or Modern stud-setters . . . Machine will drive up to ¼ inch diameter studs in lengths up to 1¼ inches in untapped holes in die castings or tapped holes in steel.

Illustration shows studs being driven in automobile grille, all to uniform height in untapped holes.

Motorized HOPPER UNITS

Speedy Sturdy Dependable

USED WITH:
Presses, Centerless Grinders, Thread Rolling and Slotting Machines, or Special Machine. Made in 4 diameters, 10", 12", 16" and 24".

FEED:
Screws, Screw Blanks, Rivets, Pins, Discs, Nuts, Bearing Rollers, Steel Balls, Washers. Also miscellaneous items, such as screw-machine parts, stampings, etc. etc.

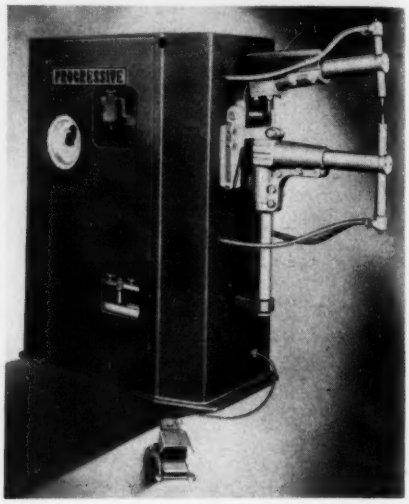
MADE IN 4 DIAMETERS: 10", 12", 16", 24"

Send Samples for Details and Prices

DETROIT POWER SCREWDRIVER CO.

2811 W. Fort Street
DETROIT 16, MICH.

compound retractable stroke cylinder. Welders have a larger range of throat opening adjustment. Transformer is directly coupled to welding

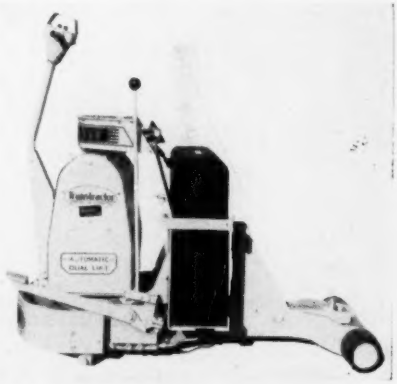


arms and is supported from the front column of the machine. All controls are group mounted except the foot switch.

Check No. 8 on Reply Card for more Details

Electric Skid Handler

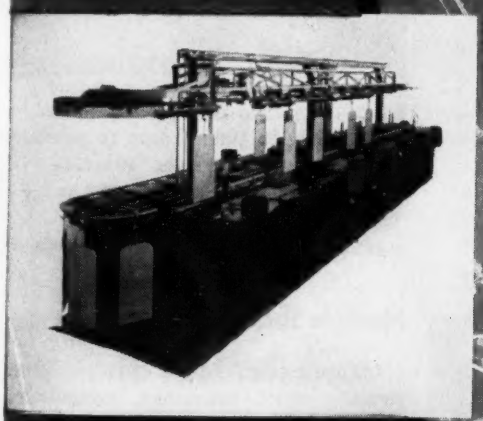
Automatic Transportation Co., 149 West 87th St., Chicago 20, Ill., is announcing a special battery powered Transtractor built to handle live and semilive skids. The truck provides full driving traction when lifting



heavy loads, maneuverability and capacity to handle skid loads of almost any size. Lifting arm is slightly forward of trailing wheels, built and positioned so that they enter beneath the skid legs or wheels.

Both lifting arm and trailing wheel assembly are built to specifications of the skids to be handled. Length of trailing frame assembly is determined by width of skid to be handled. Truck has the Dual Lift foot pump which combines high speed and low pressure hydraulic cylinder for raising lifting arm into contact with the skid and high pressure low speed cylinder for raising the load. An

"...production in the plating department has been stepped up tremendously!"



This Udylite Fully Automatic Machine turns out as high as 100 racks per hour, producing uniform finishes to laboratory exactness.

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SANITARY-DASH MANUFACTURING CO., INC.

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The Udylite Corporation
1651 Grand Boulevard
Detroit 11, Michigan

Gentlemen:

It is now nearly one year since your Udylite Fully Automatic Plating machine has been in operation.

Our production in the plating department has been stepped up tremendously. The quality of our merchandise is most satisfactory compared with the material which came from the manually operated plating equipment, and is far superior to what we have ever shipped to our trade. They have made several comments to us complimenting us on the work.

We use less men in our plating department because of this automatic equipment.

We would very highly recommend this machine to any plater.

Yours very truly,
SANITARY - DASH MFG. CO. INC.

A. Friedman

A. FRIEDMAN, GEN. MGR.

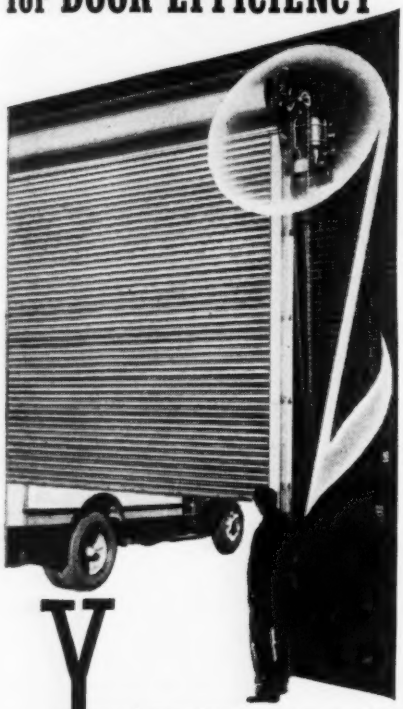
● Let Udylite Plating Machines and laboratory-tested supplies bring these important advantages to *your* operations! There is a Udylite machine for every need—small plant or mass-production line — small parts or large. Udylite will gladly analyze your operations, test your solutions, and advise you, entirely without obligation. Write *today*. The Udylite Corporation, 1651 East Grand Blvd., Detroit 11, Mich.

PIONEER OF A BETTER WAY IN PLATING . . .

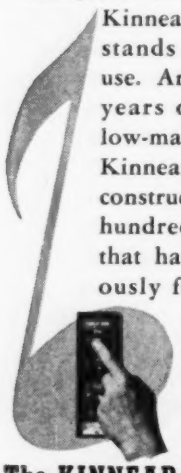
THE Udylite CORPORATION

TESTED SOLUTIONS TAILORED EQUIPMENT AUTOMATIC CONTROL FOR METAL FINISHING

The
RIGHT NOTES
for DOOR EFFICIENCY



You keep *door performance* in tune with plant efficiency when you install KINNEAR Motor Operated Rolling Doors. They respond instantly to the touch of a control button, from one or more switches placed anywhere in your plant. Their smooth, efficient, *vertical* action saves space, prevents accidents, avoids traffic tie-ups. They coil compactly out of the way overhead, safe from damage. The husky Kinnear Motor Operator stands up under hardest use. And there are extra years of protection and low-maintenance service in Kinnear's rugged, all-steel construction—as proved by hundreds of installations that have served continuously for 20, 30 and 40 years! For the "right notes" on efficient doors, send for Kinnear details today.



The KINNEAR Manufacturing Co.
Factories: 1780-1800 Fields Ave., Columbus 16, Ohio
1742 Yosemite Avenue, San Francisco 24, California
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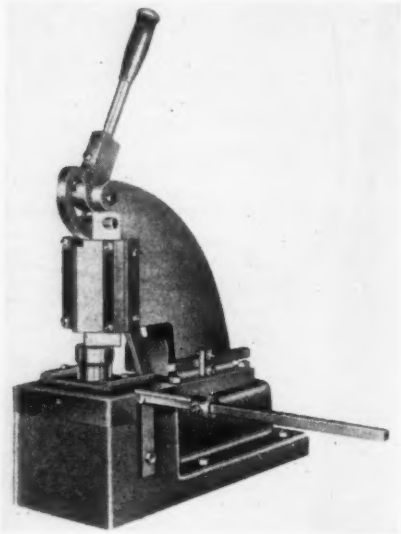
Saving Ways in Doorways
KINNEAR
ROLLING DOORS

ATCO electric lift is available. Truck has dead man control, brake applied by either raising or lowering handle and easy accessibility to all parts of drive and lifting mechanisms is a feature of the trucks.

Check No. 9 on Reply Card for more Details

Punching Machine

Besides rapidly perforating holes of various shapes and sizes as large as 4 inches in diameter, the new Di-Acro punch developed by O'Neil-Irwin Mfg. Co., 304 Eighth Ave., Lake City, Minn., may also be used as a punch press for blanking, drawing,



embossing and forming operations. Powerful action of the machine is obtained through a roller bearing cam which converts a small amount of operator effort into tremendous pressure at point of impact.

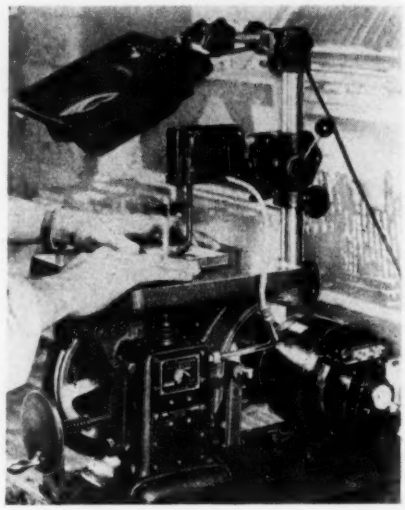
Triangular shaped ram cannot be turned or twisted. The flexible gaging arrangement can be accurately adjusted to provide precision location of the material. Although designed for short run operations, the punch is often practical for production quantities in light weight materials. Capacity of the machine is a 2 inch diameter hole in 16-gage steel plate. Height and depth of throat are $3\frac{13}{16}$ and $6\frac{1}{4}$-inches.

Check No. 10 on Reply Card for more Details

Bench Filing Machine

All American model 1500-S precision die filer, made by DoAll Co., Des Plaines, Ill., has infinitely variable speeds ranging from 170 to 470 strokes per minute. Faster cutting and longer tool life for filing, sawing or honing are obtained. Speed changes are accomplished by turning a hand wheel.

Files are offered in 12 different shapes, three grades of coarseness and two shank sizes, with corresponding cross-section sizes. For finishing work after dies are hardened, honing stones are available with either flat or radius cutting surfaces. Also available are diamond

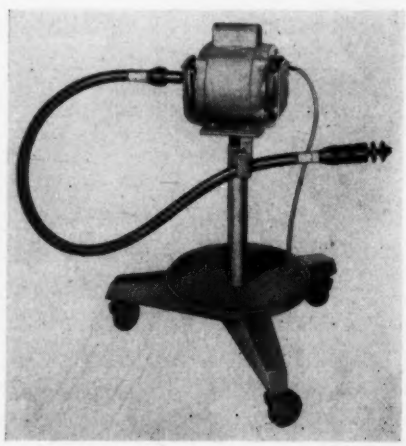


hones. Its two-power magnifier is equipped with twin lamps to provide illumination. Table of machine is $10\frac{3}{8}$-inches square and stroke is $1\frac{1}{2}$-inches.

Check No. 11 on Reply Card for more Details

Flexible Shaft Machines

Lightning line of light duty, portable flexible shaft machines, announced by Stow Mfg. Co., Binghamton, N. Y., comprises both ¼ and ½-horsepower 110-volt, 60 cycle, single phase alter-



nating current motors, with speeds of 1725 and 3450 revolutions per minute. Machines are mounted on high pedestals, making them convenient for both bench and shop work. Pedestal of the unit rides on an all steel base that is provided with free-swinging casters.

Both motors are equipped with either 5 or 6 foot shafts, each with a

3/8-inch diameter core in a 15/16-inch casing. The flexible shafts are strong enough to drive buffers, grinders, polishers, sanders, drills or wire brushes used in ordinary service. Base provides a tool tray large enough to accommodate both power and hand tools used on the job. Ball-bearing motor connections and handpieces assure free-running and trouble-free operation.

Check No. 12 on Reply Card for more Details

Tap Holder

Simplified tapping on turret lathes, drill presses, screw machines and engine lathes may be performed with the redesigned Tool-Flex neoprene mounted releasing tap holder, made by Burg Tool Mfg. Co., 5028 West Jefferson Blvd., Los Angeles 16, Calif. Blind hole tapping or tapping to a definite stop becomes possible since the turret is set to travel so deep and then the holder permits the tap to spin freely with the spindle.

When spindle is reversed, the holder locks the tap and backs it out of the piece. Neoprene mounting absorbs shock, always keeps taps on center and permits them to follow the original hole, thus preventing tap breakage due to misalignment and shock. All moving parts are of high grade tool steel, heat treated and ground to close tolerances.

Check No. 13 on Reply Card for more Details

Flexible Shaft Machines

Featuring a new type countershaft mounting spaced well above the motor tilt axis to give adequate end-

wise yielding motion to the flexible shaft as the motor assembly is tilted, the improved flexible shaft machine, introduced by Elliott Mfg. Co., Binghamton, N. Y., has handpieces, countershafts and motors of ball bearing construction. New counter shaft has a vertical adjustment operating on a lead screw principle, with finger tip knob control.

With a 3 or 4-step cone pulley on the motor shaft, the vertical adjustment is operative through over 4 inches to provide accurate belt tensioning. By substituting a variable pitch pulley, stepless speed variation through a ratio of over 2:1 is obtained. Other features are toggle switch mounted in motor end bell, circular tool tray (optional) and utility box over motor for wrenches and accessories. Nonravel flexible shafts are of cold worked music wire operating within reinforced rubber cases.

Check No. 14 on Reply Card for more Details

Die Hobbing Press

Rated at 500 tons pressure at a pressing speed of 2 inches per minute, the new die hobbing press, manufactured by E. W. Bliss Co., 450 Amsterdam Ave., Detroit 2, Mich., is for use by those needing a number of reproductions of certain dies for use in multiple stamping operations. The hydraulic press obtains these repro-

TOPFLIGHT SPEEDS INTRICATE ASSEMBLY

Component parts and leads neatly indentified

Production line assembly of motor analyzer units has been simplified by Heyer Products of Belleville, New Jersey, through the use of printed pressure-sensitive cellophane, produced by Topflight Tape.

Assembled components encased with aluminum covers are identified by name. All leads shown, connected to proper terminals, got there quickly because Topflight Tape code numbers are wrapped around each wire. In this view of the completed assembly—forty identification labels are visible.

Easy to read

Pre-assembly operations include the applying of identification stickers, which help assembly operators to make quick and sure connections.

Service men are also beneficiaries of the production planning. Repairs and replacements are quickly and intelligently made because there is no mystery about the hook-up.

TOPFLIGHT TAPE COMPANY

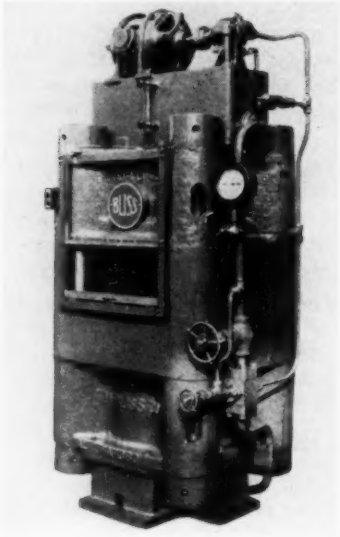
ERWIN HUBER, *President*

YORK PENNA.

Arrows indicate position of forty Topflight Tape Stickers

ductions by forcing a master punch into metal blocks. Press is completely self-contained.

The frame consists of two steel castings rigidly mounted on four heavy steel tie rods. Safety shields



are provided for openings to the die space. Control of the press is easily accomplished by means of manually operated valves fitted with hand wheels and located on front of press. Slide stroke is 6 inches, vertical opening, from 4 to 10 inches and distance between tie rods 16½ inches front to back and 21½ inches right to left.

Check No. 15 on Reply Card for more Details

• • •

METAL PROTECTOR: Designed to confine the flow of molten alloys during brazing and silver soldering to a limited area upon which the weld is applied, Anti-Capillary compound, a product of Eutectic Welding Alloys Corp., New York 13, N. Y., protects the parent metal from discoloration. Possibilities of distortion are also lessened.

Check No. 16 on Reply Card for more Details

BIN INDICATOR: The Bantam Bin-Dicator, made by Bin-Dicator Co., Detroit 15, Mich., is a diaphragm operated switch in a sealed housing which mounted on the outside of bins, hoppers, screw conveyors, etc. to signal changes in material levels. It will automatically start and stop filling and emptying equipment.

Check No. 17 on Reply Card for more Details

LETTERING INSTRUMENT: A small mechanical device for reproducing many sizes of letters from a single templet directly in ink or pencil on any suitable surface is the Varigraph lettering instrument, developed by Varigraph Co. Inc., Lincoln 3, Neb. Reproduction is to any width combined with any height between 0.075 and 0.750-inch. Letter width and height are controlled by positioning two knobs.

Check No. 18 on Reply Card for more Details

HAND TRUCK: The Floormaster Steeler is a balanced two-wheeled hand truck designed for boxes, cases, barrels, etc., by Lewis-Shepard Products Inc., Watertown 72, Mass. Of all steel welded tubular construction, the truck is available in two handle lengths and with straight or curved cross bars.

Check No. 19 on Reply Card for more Details

SPRAY BOOTH KIT: Hazards from use of inflammable paints in spray booths are reduced by the spray booth kit, an assortment of nonsparking tools suitable for cleaning and making repairs around the booth, made by Ampco Metal Inc., Milwaukee 4, Wis. Among bronze tools included are claw hammer, long blade scraper, screw driver and chisel.

Check No. 20 on Reply Card for more Details

HELICAL ROTOR PUMPS: Two helical rotors, one a driving rotor and the other an idler rotor, force the liquid ahead in an axial flow in volume and at pressure in the line of helical rotor pumps announced by Syntron Co., Homer City, Pa. Two sizes of pumps are built to handle various grades of oils at 50 or 75 gallons per minute at pressures up to 125 pounds per square inch.

Check No. 21 on Reply Card for more Details

RELIEF VALVE: A small, compact, hydraulic relief valve, made by Fluid Controls Inc., Willoughby, O., will operate at relief pressures up to 4000 pounds per square inch and will not leak at 90 per cent of full relief pressure. It is of the pilot type which employs a small valve to control the operation of a larger, or main, valve.

Check No. 22 on Reply Card for more Details

AIR DRYING COATING: Corrosion resistance and durability feature the LC-600 air drying coating for use in tanks, driers, pipe fittings, filter bodies, etc., made by Lithgow Corp., Chicago 9, Ill. Based on inert synthetic resins, it may be sprayed, dipped, roller coated or brushed on clean, unpolished, derusted surfaces.

Check No. 23 on Reply Card for more Details

STARTING SWITCH: Torq Electric Corp., 1083 Interstate Rd., Bedford, O., is announcing centrifugal starting switches of simple design. They consist of a Syncrosnap disk with integral fingers, stamped from spring material. Switch movement is preset for operation at point of maximum torque and is uniform throughout life of the motor.

Check No. 24 on Reply Card for more Details

AIR SCREW DRIVER: Model 7091 air powered reversible screw driver and nut setter, made by Aro Equipment Corp., Bryan, O., has high enough driving torque to drive No. 1 to 10 machine and wood screws and ¼-inch nuts. Low free speed of 1000 revolutions per minute prevents marring, cuts breakage. Reverse speed is equal to forward speed.

Check No. 25 on Reply Card for more Details

OUTSIDE MICROMETER: Out-of-roundness and diameters of cylindrical parts may be checked with the Ridermikrokator — Frame 523, made by Swedish Gage Co. of America, Detroit 4, Mich. Measurements are made according to the three-point principle. Frames are of malleable cast iron, provided with hardened, ground and lapped anvils. Measuring instrument is a standard mikrokator No. 220.

Check No. 26 on Reply Card for more Details

CO_2 INDICATOR: Efficiency of oil burners and other heating plants can be tested with the carbon dioxide indicator developed by F. W. Dwyer Mfg. Co., Chicago 12, Ill. Constructed of materials which make it practically unbreakable, the instrument is capable of three tests a minute. Scale is calibrated to 1/5 of 1 per cent.

Check No. 27 on Reply Card for more Details

HAND TRUCK: Two chime hooks, adjustable, lock barrels and kegs of different heights in position on the light weight general purpose hand truck built by General Scientific Equipment Co., Philadelphia 32, Pa. Balanced truck has hollow center, puncture-proof cushion tires with lug base and self lubricating bearings. Aluminum wheels are also offered.

Check No. 28 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

PRICING— The national economy is due for a jolt from United States Steel Corp.'s move toward a new pricing system on steel. The step is so far-reaching that even the "man in the street" will feel it, for in many instances he will be dislocated from his job and also be confused by a multiplicity of prices when he goes shopping.

Harassed by Federal Trade Commission action for a pricing system change and noting high court decisions handed down in pricing cases against other industries, the steel companies have seen their positions weaken. Last week's announcement by U. S. Steel, the nation's largest steel producer, that it soon will sell steel only on a f.o.b. mill basis with the customer paying all the freight is expected to set the pattern for the entire steel industry, although in a few instances mills already have substituted such a method for the multiple basing point system under which mills absorb some freight charges.

With steel customers paying all of the freight under an f.o.b. mill pricing system, the total delivered price a customer will pay will depend on how far he is from a supply source. Consequently, there will be a considerable variation in steel costs to the nation's thousands of steel users, with the result a wide spread in selling prices of their products is expected. Those who are put to a great competitive disadvantage will be faced with going out of business.

If the steel industry feels it necessary to abandon the multiple basing point method of pricing and identical delivered prices other industries which have similar systems likely may feel they have no alternative but to follow suit, as did Bethlehem Steel Co.

Meanwhile, many steel consumers are voicing disapproval of any departure from the basing point method of selling steel, and there is growing belief they will be stimulated into forcing Congress to clarify the entire pricing situation.

PRICES— Although U. S. Steel did not indicate what prices would be under the new method there has been considerable conjecture it will be accompanied with price advances to cover higher operating costs, including an anticipated wage increase to steelworkers. Elsewhere on the price front, a 5 per cent increase in the price of alloy steel was effected by one producer, pig iron was raised $4 a gross ton by one company, and oven foundry coke was advanced 90c a ton by other interests.

STEEL's arithmetical price composites were unchanged last week. They compare as follows with those of the like 1947 week: Finished steel, $80.27 and $69.82; semifinished steel, $68.62 and $52.10; steelmaking pig iron, $40.49 and $32.49; steelmaking scrap, $40.67 and $35.50.

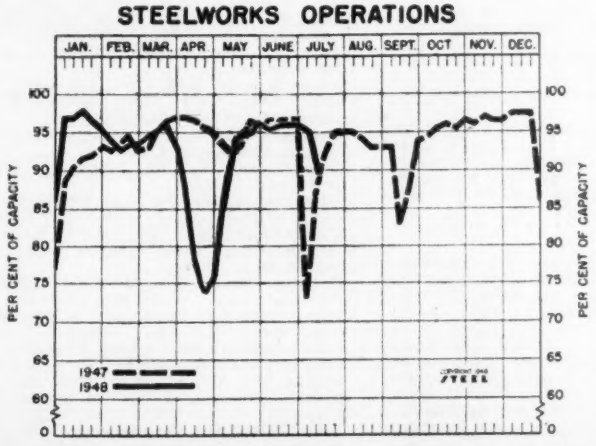
PRODUCTION— Reflecting effects of a miners' strike, the Fourth of July holiday and an explosion at a Chicago mill, the estimated national steel ingot production rate dropped 6 points last week to 89 per cent of capacity, lowest level since May 1.

DEMAND— Meanwhile, pressure for carbon steel continues unabated, with deliveries on some products even more extended than they were. Similarly, demand for alloy and stainless steels shows no signs of weakening.

SCRAP— Mill production curtailments have not softened demand for open-hearth grades of scrap, and new tonnage is coming out less actively, due in part to vacations in scrap-producing plants and the Fourth of July holiday. Some buyers are reported paying over the formula prices, but as a whole prices are steady at formulas and there is no indication of a general break away from them. Buying of cast grades is inclined to slacken, for many foundries have about reached their limit in scrap ratio to pig iron in melts, and the insufficient iron supply is tightening even further.

PIG IRON— The drop in merchant iron production stems largely from the coal mining disruption which chokes off the coke supply, although in some instances unexpected blast furnace troubles are responsible.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity engaged in Leading Districts

	Week Ended July 10	Change	Same Week 1947	Same Week 1946
Pittsburgh	83	—12.5	90.5	89
Chicago	88	— 7	92	88
Eastern Pa.	85	— 5	92	85
Youngstown	94.5	— 7.5	55	87
Wheeling	81.5	— 4	78	89
Cleveland	97.5	+ 7	75.5	89
Buffalo	101	None	88.5	88.5
Birmingham	100	None	99	99
New England	82	+ 3	83	55
Cincinnati	102	None	84	77
St. Louis	78	— 4	84.5	54.5
Detroit	101	— 2	92	89
Estimated national rate	89	— 6	87	86

Based on weekly steelmaking capacity of 1,802,476 net tons for 1948; 1,749,928 tons for 1947; 1,762,381 tons for 1946.

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	July 10	July 3	Month Ago June 1948	Year Ago July 1947	5 Years Ago July 1943
Finished Steel	$80.27	$80.27	$80.27	$70.80	$56.73
Semifinished Steel	68.62	68.62	68.62	53.04	36.00
Steelmaking Pig Iron	40.49	40.49	40.49	33.82	23.00
Steelmaking Scrap	40.67	40.67	40.67	37.23	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

June 1948	3.59296c
May 1948	3.59469c
June 1947	3.12729c
June 1943	2.47708c

***STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide base prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading basing points), and on Steelworks Scrap (No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

†FINISHED STEEL WEIGHTED COMPOSITE: Computed in cents per pound, base prices, weighted by actual monthly shipments of following products, representing 83 per cent of total steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. May and June, 1948, figures are preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton; others dollars per gross ton.

Finished Materials

	July 10, 1948	June 1948	Apr. 1948	July 1947
Steel bars, Pittsburgh	2.875c	2.875c	2.90c	2.66c
Steel bars, del. Philadelphia	3.365	3.365	3.356	2.98
Steel bars, Chicago	2.875	2.875	2.90	2.66
Shapes, Pittsburgh	2.775	2.775	2.80	2.56
Shapes, del. Philadelphia	2.98	2.98	2.968	2.64
Shapes, Chicago	2.775	2.775	2.80	2.56
Plates, Pittsburgh	2.925	2.925	2.95	2.71
Plates, del. Philadelphia	3.21	3.21	3.19	2.85
Plates, Chicago	2.925	2.925	2.95	2.71
Sheets, hot-rolled, Pittsburgh	2.775	2.775	2.80	2.56
Sheets, cold-rolled, Pittsburgh	3.50	3.50	3.55	3.27
Sheets, No. 10 galv., Pittsburgh	3.90	3.90	3.95	3.63
Sheets, hot-rolled, Gary	2.775	2.775	2.80	2.56
Sheets, cold-rolled, Gary	3.50	3.50	3.55	3.27
Sheets, No. 10 galv., Gary	3.90	3.90	3.95	3.63
Strip, hot-rolled, Pittsburgh	3.05	3.05	3.05	2.56
Strip, cold-rolled, Pittsburgh	3.775	3.775	3.80	3.27
Bright basic, bess, wire, Pittsburgh	3.725	3.725	3.775	3.475
Wire nails, Pittsburgh	5.125	5.125	5.20	3.975
Tin plate, per base box, Pittsburgh	$6.60	$6.60	$6.70	$5.75

Semifinished

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$60.00	$47.50
Slabs, Pittsburgh, Chicago	45.00	45.00	45.00	38.92
Rerolling billets, Pittsburgh	45.00	45.00	45.00	38.92
Wire rod 7/32 to ¼-inch, Pitts.	3.175c	3.175c	3.175c	2.63c

Pig Iron

	July 10, 1948	June 1948	Apr. 1948	July 1947
Bessemer, del. Pittsburgh (N.&S. sides)	$44.08	$44.08	$40.996	$36.03
Basic, Valley	39.00	39.00	39.00	34.20
Basic, eastern del. Philadelphia	42.17	42.17	42.004	36.47
No. 2 fdry., del. Pgh. (N.&S. sides)	43.58	43.58	40.496	35.53
No. 2 fdry., del. Philadelphia	42.67	42.67	42.504	37.21
No. 2 foundry, Chicago	39.00	39.00	39.00	34.20
No. 2 foundry, Valley	39.50	39.50	39.50	34.70
Southern No. 2, Birmingham	39.38	39.38	37.88	31.98
Southern No. 2, del. Cincinnati	45.09	45.09	42.23	36.85
Malleable, Valley	39.50	39.50	39.50	34.70
Malleable, Chicago	39.50	39.50	39.50	34.70
Charcoal, low phos., fob Lyles, Tenn.	58.00	58.00	55.00	43.00
Ferromanganese, fob cars, Pittsburgh	151.00	151.00	151.00	140.25

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$40.25	$40.25	$40.25	$37.20
Heavy melt. steel, No. 2, E. Pa.	39.00	39.00	39.00	38.06
Heavy melt. steel, No. 1 Chicago	39.25	39.25	39.10	35.95
Heavy melt. steel, No. 1, Valley	40.25	40.25	40.25	37.35
Heavy melt. steel, No. 1, Cleveland	39.75	39.75	39.75	37.65
Heavy melt. steel, No. 1, Buffalo	44.00	43.00	43.00	37.90
Rails for rerolling, Chicago	54.50	53.75	49.50	43.20
No. 1 cast, Chicago	68.50	68.38	68.40	41.10

Coke

Connellsville, beehive furnace	$13.00	$13.00	$12.55	$11.20
Connellsville, beehive foundry	15.50	15.22	14.875	13.05
Chicago, oven foundry, del.	20.80	20.80	19.25	17.46

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, open market, $90-$95 per gross ton. Forging quality $46 per net ton, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56 per gross ton.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Buffalo, Birmingham, $45 per net ton; Cleveland, $47 per net ton; sales by smaller interests on negotiated basis at $85 per gross ton, or higher.

Forging Quality Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, $54 per net ton.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66 per gross ton.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Youngstown, $60 nom., per net ton; sales in open market $95-$105 per gross ton.

Skelp: Pittsburgh, 2.85-2.90c; Youngstown, 2.90c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69-70 per net ton; some sellers quoting up to $120 per gross ton.

Wire Rods: Pittsburgh, Chicago, Birmingham, 7/32 to ¼-in., inclusive, $2.80-3.55 per 100 lb. 7/32 to 41/64-in., inclusive, $2.75, Cleveland; Galveston, $2.95; Worcester, $2.90-2.95. San Francisco (base del.), $3.5245.

Bars

Hot-Rolled Carbon Bars (O.H. only) and Bar-Size Shapes under 3-in. (Base 20 tons one size): Pittsburgh, Youngstown, Chicago, Gary, Birmingham, 2.85-2.90c; Cleveland, Buffalo, 2.90c; Detroit, del., 3.11c; eastern Mich., 3.18c; New York, del., 3.43c; Phila., del., 3.34-3.39c; San Francisco (base, del.), 3.5845-3.95c; Los Angeles (base, del), 3.579-3.86c; Seattle, 3.8375-3.85c, base.

Rail Steel Bars: Same basing points as merchant carbon bars. Prices upon application.

Hot-Rolled Alloy Bars (Base 20 tons one size): Pittsburgh, Youngstown, Chicago, Gary, 3.20-3.30c; Canton, Massillon, Buffalo, Bethlehem, 3.30c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars (Base 40,000 lb): Pittsburgh, Chicago, Gary, Cleveland, Buffalo, 3.45-3.55c; Detroit, del. 3.66c; Toledo, 3.73c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Cleveland 4.00-4.10c; Gary, Buffalo, Canton, base 4.10c.

Reinforcing Bars (New Billet): Pittsburgh, 2.70-2.75c; Chicago, Gary, Youngstown, Birmingham, 2.70c; Sparrows Point, Buffalo, base 2.75c; San Francisco (base, del.), 3.3345c; Los Angeles (base, del.), 3.329c; Seattle, 3.88c-4.18c base.

Iron Bars: Single refined: Pittsburgh 7.70c (hand puddled), Economy, Pa., 8.65c. Double refined: Pittsburgh 9.75c (hand puddled), Economy, Pa., 10.00c. Staybolt: Pittsburgh 11.25c (hand puddled), Economy, Pa., 10.20c.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.75-2.80c; Cleveland, Buffalo, Sparrows Point, Ashland, Ky., base, 2.80c; Detroit, del., 3.01c; eastern Mich., del., 3.08c; Philadelphia, del., 3.06c; New York, del., 3.18c; Los Angeles (base, del.), 3.494-3.544c; San Francisco, (base, del.) 3.4995-3.5495c. (Alan Wood Steel Co., Conshohocken, Pa., quotes 4.20c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Gary, 3.45-3.55c; Cleveland, Middletown, 3.50-3.55c; Buffalo, Youngstown, Sparrows Point, 3.55c; Granite City, 3.65c; Detroit, del., 3.66-3.76c; eastern Mich., del., 3.73-3.83c; New York, del., 3.93c; Philadelphia, del., 3.81c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Gary, Birmingham, 3.85-3.95c; Chicago, Sparrows Point, Canton, Middletown, 3.95c; Kokomo, 4.55c; Youngstown, 3.95-4.45c; Granite City, 4.05c; New York, del., 4.33c; Philadelphia, del., 4.21c; Los Angeles (base, del.), 4.624c; San Francisco (base, del.), 4.6295c.

Corrugated Galvanized Sheets, No. 10 (Based on 5-cent zinc): Pittsburgh, Chicago, 3.95-4.05c; Gary, Birmingham, Canton, Youngstown, Middletown, 3.95c.

Culvert Sheets, No. 16 flat (based on 5-cent zinc; corrugated 10 cents extra): Copper alloy: 4.45-4.55c, Pittsburgh, Gary; 4.55c Chicago; 4.90c, Kokomo; 5.00c, Granite City; 5.344c (base del.), Los Angeles; 5.3495c (base del.), San Francisco.
Copper-iron or pure iron: 4.80-4.90c, Pittsburgh; 4.80c, Gary, 4.90c, Chicago, Kokomo, Canton; 5.35c, Granite City.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 4.05c.

Enameling Sheets, No. 12: Pittsburgh, 3.85-3.95c; Chicago, Gary, 3.75-3.95c; Cleveland, Middletown, 3.85c; Youngstown 3.95c-4.45c; Granite City, 4.05c; Detroit, del., 4.16c; eastern Mich., 4.23c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.40-4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, 4.70-5.30c; Chicago, Gary, 4.70-4.80c; Granite City, Ill., 5.25c; Kokomo, Ind., 4.90c. Electrical: Pittsburgh, 5.20-5.80c; Chicago, Gary, 5.20-5.30c; Granite City, Ill., 5.75c; Kokomo, Ind., 5.40c. Motor: Pittsburgh, 5.95-6.80c; Chicago, Gary, 5.95-6.05c; Granite City, 6.50c. Dynamo: Pittsburgh, 6.65-7.00c; Granite City, 7.20c. Transformer 72, 7.15-8.25c; 65, 7.85-9.20c; 58, 8.55-9.90c; 52, 9.35-9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, 2.80c-3.30c; Chicago, Gary, Birmingham, Youngstown, Cleveland, 2.75-2.80c; Detroit, del., 3.01c; eastern Mich., del., 3.08c; San Francisco (base, del.) 3.5595c; Los Angeles (base, del.), 3.554c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, 3.50-4.05c; Cleveland, 3.45-3.85c; Youngstown, 3.55-3.85c; Chicago, Gary, 3.55-3.65c. Detroit, del, 3.66-3.76c; eastern Mich., 3.73-3.83c; Worcester, base, 3.65-3.75c.

Cold-Finished Spring Steel: Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 4.95-5.05c; over 0.60 to 0.80, 5.55-5.65c; over 0.80 to 1.05, 7.05-7.15c; over 1.05 to 1.35, 9.35-9.45c; add 0.20c for Worcester.

Tin, Terne Plate

Tin Plate: Pittsburgh, Chicago, Gary, per base box of 100 lb, 1.25 lb coating $6.50, 1.50 lb coating $6.70; Sparrows Point, Birmingham and Warren, O., $6.60 and $6.80, respectively; Granite City, $6.70 and $6.90, respectively.

Electrolytic Tin Plate: Pittsburgh, Gary, per base box of 100 lb, 0.25 lb tin, $5.70; 0.50 lb tin, $5.90; 0.75 lb tin $6.10; Sparrows Point, Birmingham and Warren, O., $5.80, $6.00, $6.20, respectively; Granite City, $5.90, $6.10, $6.30, respectively.

Can Making Black Plate: Pittsburgh, Gary, per base box of 100 lb, 55 to 70 lb basis weight, $5.10; 75 to 95 lb basis weight, $5.00; 100 to 128 lb basis weight, $5.10. Birmingham and Warren, O., $5.20, $5.10, $5.20, respectively.

Holloware Enameling Black Plate: Pittsburgh, Chicago, Gary, base 29-gage, 4.65c per lb; Sparrows Point, Warren, O., 4.75c; Granite City, 4.85c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, per base box of 100 lb, $5.80; Birmingham, Sparrows Point, $5.90; Granite City, $6.

Roofing Ternes: Pittsburgh, per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $15.30.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, 2.90-2.95c; Cleveland, Sparrows Point, 2.95c; Coatesville, 3.45c; Claymont, 3.65c; Geneva, Utah, 2.90c; Det., del., 3.21c; New York, del., 3.33c; Phila., del., 3.21c; Boston, del., 3.51c; St. Louis, del., 3.269c; San Francisco and Los Angeles, del., 3.493c for sizes and grades produced at Geneva; 3.76c for sizes and grades produced at Fontana, Calif.

(Central Iron & Steel Co., Harrisburg, Pa., 5.10c, basing points.)

Floor Plates: Pittsburgh, 4.05c; Chicago, 3.95-4.05c; Gary, 3.95c; Cleveland, 4.05-4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, Gary, 3.70c; Coatesville, 4.80c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 24.00c.

Wrought Iron: Economy, Pa., 7.25c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, 2.75-2.80c; Buffalo, Bethlehem, 2.80c; New York, del., 3.06c; Phila., del., 2.98c; Geneva, Utah, 2.75c; Los Angeles (base, del.), 3.424-3.474c for sizes produced at Torrance, Calif.; Los Angeles and San Francisco, del., 3.343c for sizes produced at Geneva, 3.81c for sizes produced by Bethlehem in East; San Francisco, del., 3.54c for sizes produced at Fontana, Calif.

Beams, Wide Flange: Pittsburgh, Chicago, 2.70c.

Alloy Structural Shapes: Pittsburgh, Chicago, Gary, 3.45-3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds.)

Wire to Manufacturers in carloads

Bright, basic or bessemer..... *$3.45-4.00
Basic MB Spring (except Birm.)..**$4.85-4.95
Upholstery Spring (except Birm.) †$4.50-4.60

Wire Products to Trade in carloads

Wire, Merchant Quality
Annealed (6 to 8 base).....††$4.10-4.20
Galvanized (6 to 8 base).....††$4.55-4.65

(Fob Pittsburgh, Chicago, Duluth, Birmingham, per base column).

Nails
Standard, cement-coated, galvanized.. ‡91-94
Staples, polished and galvanized..... ‡‡91-94
Woven fence, 15½ gage and heavier. §97-100
Barbed wire, 80-rod spool .....§§111-113
Fence Posts (with clamps)..... ★107
Bale ties, single loop .....★★94-100

* Worcester, $3.55; Duluth, $3.50; San Francisco (base, del.) $4.4645 bright basic only.

** Worcester, $4.95; Duluth & Trenton, N.J., $5.10 (bright only); San Francisco (base del.) $5.8845.

† Worcester $4.60; Duluth and Trenton, N. J., New Haven, Conn., $4.75; San Francisco (base, del.), $5.5345 black upholstery.

†† One producer quotes annealed, 4.45c, galvanized, 4.90c, Birmingham and Chicago; Worcester $4.20 annealed, $4.65 galvanized; Duluth $4.10 annealed, $4.55 galvanized; Kokomo, Ind., $4.80 annealed, $5.25 galvanized; San Francisco (base, del.) $5.1145 annealed, $5.5645 galvanized.

‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester, Cleveland 97; Duluth, 91; San Francisco (base, del.) 112.

‡‡ Cols. 108 and 114 also quoted Pittsburgh; Worcester 97; San Francisco (base del.) 112.

§ Col. 101 also quoted at Pittsburgh; San Francisco (base del.) 120.

§§ San Francisco (base del.) 131.

★ Duluth, 104.

★★ San Francisco (base del.) 118; Chicago, Birmingham, 94-99.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.70-$2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.05 per 100 lb; light rails (rail-steel), prices upon application. Relaying, 60 lb and over fob warehouse $60-$65 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates $3.55-$3.65 per 100 lb, fob mill; $3.40 base. Seattle; $3.70 fob Pittsburg, Calif. Splice bars $3.75-$3.85 per 100 lb fob mill. Standard spikes, 4.85c; screw spikes, 6.75c. Axles 4.45-4.50c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 to 2 points less on steel butt weld on sizes produced in that district.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Butt Weld Blk.	Butt Weld Gal.
⅛	44½	17	1	52½– 53½	36½– 37½
¼	44½	21½	1¼ ...	53– 54	37– 38
⅜	41	17	1½ ...	53½– 54½	37½– 38½
½	47– 48	29½– 30½	2	54– 55	38– 39
¾	50– 51	33½– 34½	2½, 3..	54½– 55½	38½– 39½

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2	44½	28	44	27½	43½	27
2½ & 3	48½	32	47	30½	46½	30
3½-6 ..	50½	34	49	32½	48½	32

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	43½	1	51½-52½
¼	43½	1¼	52-53
⅜	40	1½	52½-53½
½	46–47	2	53-54
¾	49–50	2½ & 3....	53½-54½

In.	Lap Weld	Elec. Weld	Seamless
2	43½	43	42½
2½ & 3	46½	46	45½
3½-6	48½	48	47½
8	50½	50	49½
10	50	49½	49
12	49	48½	48

Standard Wrought Iron Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh.

In.	Butt Weld Blk.	Butt Weld Gal.	In.	Lap Weld Blk.	Lap Weld Gal.
⅜...	+46½	+74½	1¼..	+12	+34½
½...	+11	+35	1½..	+ 6	+27½
¾...	+ 1½	+25	2....	— 1½	+20
1 and 1¼	— 4	+16½	2½-3½—	4	+16
1½..	— 9½	+13	4....	— 8	+10½
2....	—10	+12½	4½-8.	— 6	+12
			9-12 .	+ 3	+21½

Boiler Tubes: Net base c.l. prices, dollars per 100', fob Pittsburgh; minimum wall thickness, cut lengths 4 to 24", inclusive.

Prices effective as of May 1, 1948.

O.D. In.	B.W. Ga.	Seamless Hot Rolled	Seamless Cold Drawn	Elec. Weld Hot Rolled	Elec. Weld Cold Drawn
1	13	.....	12.21-12.46	11.51	11.51
1¼	13	.....	14.46-14.76	11.48	13.64
1½	13	13.72-14.00	16.14-16.47	12.69	15.22
1¾	13	15.60-15.92	18.37-18.74	14.43	17.31
2	13	17.48-17.84	20.57-20.99	16.17	19.39
2¼	13	19.48-19.88	22.93-23.40	18.02	21.62
2½	12	21.46-21.90	25.25-25.77	19.86	23.80
2½	12	23.51-23.99	27.65-28.21	21.75	26.06
2¾	12	24.91-25.42	29.30-29.90	23.05	27.63
3	12	26.15-26.68	30.77-31.40	24.18	29.00
3¼	11	30.44-31.06	35.82-36.55	28.16	33.77
3½	11	32.68-33.35	38.47-39.26	30.23	36.27
4	10	40.57-41.40	47.73-48.70	37.53	44.99
4½	9	53.77-54.87	63.29-64.58	....	....
5	9	62.25-63.52	73.25-74.74	....	....
6	7	95.56-97.51	112.44-114.73	....	....

Pipe Cast Iron: Class B, 6-in. and over $79.50 per net ton, Birmingham; $84.50, Burlington, N. J.; $91.12, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 19c per cwt in carlots, Lebanon, Pa. Additional discounts: 5 for carloads; 15 for full containers, except tire, step, plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ⅝ x 6-in. and shorter.....	46 off
⅝-in. and larger x 6-in. and shorter.	43 off
All diameters longer than 6-in.....	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts, 6 in. and shorter.....	46 off
Lag bolts, longer than 6 in.....	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 75 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

Semifinished hexagon	A.S. Light	A.S. Reg. and Heavy
⅜-in. and smaller.....	46 off	.....
½-in. and smaller.....	.....	44 off
½-in.-1-in.	44 off	.....
⅝-in.-1-in.	.....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger.....	.....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright).....	53 off
Upset (1035 heat treated)	
¾ and smaller x 6 and shorter.....	48 off
⅞, 1, & 1 x 6 and shorter.....	44 off

Square Head Set Screws

Upset 1-in. and smaller.....	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pitts., Cleve., Chicago, Birmingham
Structural ½-in. and larger..... 5.65c
Fob Lebanon, Pa.
Structural ½-in. and larger..... 5.65c*
⅞-in. and larger ..... 55 off*

* Plus 19c per cwt in cl; 26c in lcl.

Washers, Wrought

Fob Pitts., Chicago, Philadelphia, to jobbers and large nut and bolt mfrs.....$1-$2 off

Tool Steels

Tool Steels: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, cents per lb, Pittsburgh, Chicago, Cleveland, Bethlehem, Canton, Massillon, Middletown, Watervliet, Dunkirk, Syracuse, Reading, Ft. Wayne, Titusville, Brackenridge, Jersey City, W. Leechburg, Baltimore and Washington, Pa.

Grade	Bars, Wire, Shapes	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301....	26.00c	29.50c	37.00c	22.00c	28.00c
302....	26.00	29.50	37.00	23.50	30.50
303....	28.50	31.50	39.00	29.50	36.00
304....	27.50	31.50	39.00	25.50	32.50
308....	31.50	37.00	44.50	31.00	38.00
309....	39.00	43.50*	51.00*	40.50	51.00
310....	53.50	56.50†	57.50‡	53.00	61.00
316....	43.50	48.00	52.00	43.50	52.00
321....	31.50	37.00	44.50	32.00	41.50
347....	36.00	41.50	49.00	36.00	45.50
431....	21.00	24.00	31.50	19.00	24.50
440A ..	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
410....	20.50	23.50	29.00	18.50	24.00
416....	21.00	24.00	29.50	20.00	25.50
420....	26.00	31.00	36.50	26.00	39.50
430....	21.00	24.00	31.50	19.00	24.50
430F ..	21.50	24.50	32.00	20.50	27.00
442, 443	24.50	28.00	35.50	26.00	35.00
446....	30.00	33.00	39.50	38.00	56.50
§501...	9.00	13.00	17.50	13.00	18.50
§502...	10.00	14.50	18.50	14.50	19.50
STAINLESS CLAD STEEL (20%)					
304....	....	24.00	22.00	....	....
410....	....	22.00	20.00	....	....
430....	....	22.50	20.50	....	....
446....	....	29.00	27.00	....	....

One producer quotes: * 6.50c higher, † 3.50c higher, ‡ 10.00c higher. § Low chromium. ** Fob Pittsburgh, Washington and Coatesville, Pa.; plate prices include annealing, pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., base	$40.00	$40.50	$41.00	$41.50
Newark, N. J., del.	42.39	42.89	43.39	43.89
Brooklyn, N. Y., del.	....	44.40	44.90	....
Philadelphia, del.	42.17	42.67	43.17	43.67
Birmingham, base	38.88	39.38	....	....
Cincinnati, del.	....	45.09	....	....
Buffalo, base	40.00†	40.00†	40.50†	41.00
Boston, del.	48.42	48.42	48.92	....
Rochester, del.	42.22	42.22	42.72	43.22
Syracuse, del.	43.025	43.025	43.525	44.025
Chicago, base	38.50	39.00	39.50	40.00
Milwaukee, del.	40.22	40.72	41.22	41.72
Muskegon, Mich., del.	....	43.98	44.48	....
Cleveland, fob furnace	38.50†	39.00†	39.50†	40.00
Akron, del.	40.67	41.17	41.67	42.17
Duluth, base	39.00	39.50	40.00	40.50
Erie, Pa., base	38.50	39.00	39.50	40.00
Everett, Mass., base	....	48.75	49.25	....
Granite City, Ill., base	45.25	45.75	46.25	....
St. Louis, del.	46.00	46.50	47.00	....
‡Neville Island, Pa., base	42.00	42.50	42.50	43.00
Pittsburgh, del., N.&S. Sides	43.08	43.58	43.58	44.08
Provo, Utah, base	39.00	39.50	....	....
Seattle, Tacoma, Wash., del.	....	46.63	....	....
Portland, Oreg., del.	....	46.63	....	....
Los Angeles, San Francisco.	46.13	46.63	....	....
Sharpsville, Pa., base	43.00	43.50	43.50	43.00
Steelton, Pa., base	40.00	40.50	41.00	41.50
Struthers, O., base	42.50	....	....	....
Swedeland, Pa., base	45.00	45.50	46.00	46.50
Toledo, O., base	38.50	39.00	39.50	40.00
Cincinnati, del.	43.05	43.55	....	....
Youngstown, O., base	39.00	39.50	39.50	40.00
Mansfield, O.	42.87	43.37	43.37	43.87

† Republic Steel Corp. quotes $2.875 higher for No. 2 foundry and malleable and $2.375 higher for basic at Buffalo, and $1.25 higher at Cleveland, effective on shipments during week ended July 11.

‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaco; $1.73 Verona; $1.94 Brackenridge; $1.08 to Ambridge and Aliquippa.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)	$53.50		
6.51-7.00	54.75	9.01- 9.50	61.00
7.01-7.50	56.00	9.51-10.00	62.25
7.51-8.00	57.25	10.01-10.50	63.50
8.01-8.50	58.50	10.51-11.00	64.75
8.51-9.00	59.75	11.01-11.50	66.00

Fob Jackson, O., per gross ton. Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $78.75, Niagara Falls; $78 open-hearth and $79 foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.05% Mn over 1%; $1 a ton for 0.045% max. phos

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn. $58 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $42.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $46.00. Philadelphia, $48.81, delivered. Intermediate phosphorus, Central furnace, Cleveland, $42.00.

Differentials

Basing point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$12.00-$14.00†
Connellsville, foundry	14.50- 16.50†
New River, foundry	15.50
Wise county, foundry	14.25
Wise county, furnace	13.50

† Nominal.

Oven Foundry Coke

Kearney, N. J., ovens	$20.50
Chicago, outside del.	19.50
Chicago, del.	20.80
Terre Haute, ovens	20.25
Milwaukee, ovens	20.25
New England, del.	21.75
Birmingham, del.	16.71
Indianapolis, ovens	20.10
Cincinnati, del.	20.50
Ironton, O., ovens	18.25
Erie, Pa., del.	21.55
Painesville, O., ovens	20.00
Cleveland, del.	21.55
Buffalo, del.	22.65
Detroit, del.	21.65
Philadelphia, ovens	19.55
Swedeland, Pa., ovens	19.50
Portsmouth, O., ovens	18.25

Coal Chemicals

Spot, cents per gallon

Pure and 90% benzol	21.00†
Toluol, two degrees	28.00
Industrial xylol	28.00
Solvent naphtha	28.00

Per pound fob works

Phenol (car lots, returnable drums)	13.00
Do., less than carlots	13.75
Do., tank cars	12.00

Eastern plants, per pound

Naphthalene flakes, balls, bbl. to jobbers, "household use"	12.00

Per ton, bulk, fob plants

Sulphate of ammonia	$40.00

† Freight allowed up to 2 cents.

Refractories

(Base prices per 1000, fob plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Mo., Olive Hill, Ky., or Clearfield, Pa., $100.

High-Heat Duty: Salina, Pa., $85; Woodbridge, N. J., $86; St. Louis, Vandalia, Mo., West Decatur, Orviston, Clearfield, or Beach Creek, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, Haldeman, or Athens, Ky., Troup, Tex., Stevens Pottery, Ga., or Portsmouth, O., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Pa., $66.

Ladle Brick

Dry Press: $50.
Wire Cut: $48.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., $83; Beach Creek, Pa., $73.

Silica Brick

Mt. Union, Claysburg, Sproul, Pa., or Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., $81.

Basic Brick

(Base prices per net ton); f.o.b works, Baltimore or Chester, Pa.)

Chrome brick or chemical-bonded chrome brick, $69, magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, fob works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains: Bulk, $31; single paper bags, $35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned, bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibonsburg, Woodville, O., $11.85; Thornton, McCook, Ill., $11.95; Dolly Siding, Bonne Terre, Mo., $12.05.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural) Lower Lake Ports

(Any increase or decrease in R. R freight rates, dock handling charges and taxes thereon effective after Apr. 1, 1948, are for buyer's account.)

Old range bessemer	$6.60
Old range nonbessemer	6.45
Mesabi bessemer	6.35
Mesabi nonbessemer	6.20
High phosphorus	6.20

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic contract	56.62% 15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom
Swedish basic, 60 to 68%	13.50-14.00
Spanish, No. African basic, 50 to 60%	Nom
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid $26-$28

Manganese Ore

48-50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 67.60c-72.60c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$25.50-$26.00
45% no ratio	26.50
48% no ratio	29.00-30.00
50% no ratio	29.50-30.50
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., lb., Mo., cont., Mines $0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $35; less than 60% $32.

HIGH STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Cleveland	Bethlehem	Canton Massillon
Sheet, Hot-Rolled	4.20	4.20–4.30	4.20–4.30	4.20–4.30	4.30	4.30	4.20	...	...
Cold-Rolled	5.20	5.20–5.30	5.20–5.30	5.20–5.30	...	5.30	5.20	...	...
Galvanized	5.90	.....	.....	.....	...	6.00	...	...	...
Strip, Hot-Rolled	4.20	4.30	4.20–4.30	4.20–4.30	...	...	4.20	...	...
Cold-Rolled	5.20	5.30†	5.30†	5.30	...	...	5.20	...	...
Shapes, Structural	4.20	4.20–4.30	4.20	4.30	...	...	...	4.30	...
Plates	4.45	4.45–4.55	4.45–4.55	.....	4.55	...	...	...	...
Bars, Small Shapes	4.35	4.35–4.45	4.35–4.45	4.35–4.45	...	4.45	...	...	4.45

† Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher.

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS			STRIP		BARS				PLATES	
	H-R 10 Ga.	C-R 17 Ga.	Gal. *10 Ga.	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½" & up	H-R Alloy **4140	Structural Shapes§§	Carbon ⅝"-¾"	Floor ⅝" & Thicker
Boston (city) ..	5.08	5.84[4]	6.28[4]	5.64	6.90	5.09	5.96	7.70	4.94	5.23	6.89
Boston (c'try)..	4.98	5.64[4]	6.08[4]	5.44	...	4.89	...	...	4.74	5.03	6.69
New York (city)	4.94	5.80	6.13	5.58	...	5.05	5.78	7.23	4.77	5.09	6.58
New York (c'try)	4.79	5.65	5.98	5.43	...	4.90	...	...	4.62	4.94	6.43
Phila. (city)...	4.87	5.81	5.92	5.36*†	...	4.91	5.73	7.30	4.59	4.87	6.36
Phila. (c'try.)..	4.72	5.66	5.77	5.21*†	...	4.76	...	...	4.44	4.72	6.21
Wash. (city) ..	4.81	...	...	5.08	...	5.14	5.79	...	4.98	5.03	6.68
Wash. (c'try.) .	4.71	...	...	4.98	...	5.04	...	...	4.88	4.93	6.58
Balt. (city) ...	4.27†	5.59	5.62	4.79	...	4.84	5.66	...	4.69	4.72	6.09
Balt. (c'try.) .	4.12†	5.44	5.40	4.64	...	4.69	...	...	4.54	4.57	5.94
Norfolk, Va. ..	4.90	...	...	...	...	5.20	6.00	...	5.15	5.15	6.90
Memphis (city)	4.91[20]‖	5.98[8]†	...	5.11[20]	...	5.01[20]	5.88	...	5.01[20]	5.21[20]	6.83[20]
Memphis (c'try)	4.81[20]‖	5.88[8]†	...	5.01[20]	...	4.91[20]	5.78	...	4.91[20]	5.11[20]	6.73[20]
Buffalo (city) .	4.25	5.20[5]	6.05	5.25	5.97	4.40	5.10	6.85	4.40	5.00	6.25
Buffalo (c'try.)	4.10	5.05[5]	5.50	4.70	5.82	4.25	4.95	6.85	4.25	4.45	5.75
Pitts. (city) ..	4.20-4.25‖	5.05-5.10[8]†	5.60-5.65	4.30-4.35	5.35	4.35-4.40	5.05-5.10	6.70	4.35-4.40	4.55	5.90
Pitts. (c'try) ..	4.05-4.10‖	4.85-4.95[8]†	5.40-5.50	4.15-4.20	5.20	4.20-4.25	4.85-4.95	6.70	4.20-4.25	4.40	5.75
Cleve. (city) ..	4.45	5.10[8]	5.84	4.52	5.25	4.40	5.00-5.10	7.14	4.67	4.60	5.90
Cleve. (c'try.) .	4.30-4.90	4.95-5.75[8]	...	...	5.10	4.25	4.85-4.95	...	...	4.45	5.75
Detroit	4.66	5.31	6.10	4.75	5.97	4.61	5.49	7.47	4.80	4.95	6.25
Cincinnati	4.51-4.66	5.22	5.77	4.80	6.00	4.76	5.59	...	4.80	4.96	6.21
Indianapolis ...	4.52	5.01[8]	5.96	4.62	5.87	4.67	5.52	8.85	4.67	4.87	6.17
Chicago (city) .	4.40	5.10[8]	5.55-5.65	4.30	5.35	4.35	5.00	6.70[9]	4.35	4.55	5.80
Chicago (c'try.)	4.25	4.95[8]	5.40-5.50	4.15	5.20	4.20	4.85	6.70[9]	4.20	4.40	5.65
Milwaukee	4.62	5.32[8]	5.77-5.87	4.52-5.02	5.57	4.57	5.334	7.184[9]	4.57	4.77	6.02
St. Paul, Minn..	4.66[6]	5.56[8]†	6.01[8]	4.76	6.29[13]	4.81[6]	5.94[11]	7.84[11]	4.81[6]	5.01[6]	6.26[6]
St. Louis	4.79	5.49[8]	6.27	5.24	5.97	4.74	5.62[12]	8.97	4.74	4.94	6.19
Birming. (city).	4.45[20]‖	...	5.65	4.45[20]	...	4.40[20]	6.09[22]	...	4.40	4.65	6.99
Birming. (c'try.)	4.30[20]‖	...	5.50	4.30[20]	...	4.25[20]	...	...	4.25	4.50	...
Houston, Tex. .	5.75	...	7.36	6.00	...	5.70	7.00	9.25[9]	5.70	5.90	7.20
Omaha, Nebr...	5.31	...	6.76	5.41	...	5.46	6.96	...	5.41	5.66	5.65
Los Angeles ...	5.70‖	7.25[8]	7.30	6.00	8.60	5.45	7.25[1]	9.40[3]‡‡	5.15-5.30	5.35	7.40
Seattle-Tacoma.	5.45[17]‖	7.25[8]‡	7.10	6.15[17]	...	5.65[17]	7.35[1]	8.70[12]	5.30[17]	5.60[17]	7.65[17]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 39,999 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—400 to 14,999 lb; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [13]—2000 lb and over; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Includes gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; ‖ 18 gage and heavier; ** as rolled; †† add 0.40 for sizes not rolled in Birmingham; ‡‡ annealed; §§ except wide flange beams, which are 0.05c lower; 12G. & heavier and includes machine straightening.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $52, Palmerton, Pa., $51, Pittsburgh; (16% to 19% Mn.) $1 per ton lower. **Standard Ferromanganese:** (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $157, ton lot $172, less ton $189, fob New Orleans, Mobile, Philadelphia, Baltimore, New York. Carload, lump, bulk, $150 fob Rockwood, Tenn.; $150.50 fob Aetna, Pa., or $151.15 within Pittsburgh switching limits. Add or subtract $1.80 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. West Coast Prices: Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $26.21 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Eastern Zone, carload, lump, bulk, max. 0.10% C, 22.5c per lb of contained Mn, carload packed 23.25c, ton lot 24.35c, less ton 25.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17.25c, ton lot 18.35c, less ton 19.55c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c. **Silicomanganese:** (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.8c per lb of alloy, carload packed, 8.55c, ton lot 9.45c, less ton 10.45; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 18.6c per lb of contained Cr, c.l., packed 19.5c, ton lot 20.65c, less ton 22.05c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, c.l., 8MxD, bulk 20.1c per lb of cotnained Cr, c.l., packed 21.0c, ton lot 22.35c, less ton 24.1c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 28.5c per lb of contained Cr, 0.04% C 27.5c, 0.05% C 27.0c, 0.06% C 26.5c, 0.10% C 26.0c, 0.15% C 25.5c, 0.20% C 25.25c, 0.50% C 25.0c, 1% C 24.5c, 2% C 24.25c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed, Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, add C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 25c per lb of contained chromium, carload, packed 26.1c, ton lot 27.3c, less ton 29.1c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Mn. 97% Cr and 1% Fe). Eastern Zone, contract, carload, 1" x D; packed, max. 0.50% C grade, 93c per lb of contained chromium, ton lot 94.5c, less ton 97c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

20-30% Ferrosilicon: Contract, carload, lump, bulk, 16.50c per lb. of contained Si, fob Niagara Falls, N. Y.

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 9.3c per lb of contained Si, carload packed 10.9c, ton lot 12.35c, less ton 14.0c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (All 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 11.8c per lb of contained Si carload packed 13.1c, ton lot 14.25c, less ton 15.5c; Central, add 0.3c for c.l. add 0.75c for l.c.l.; Western, add 1.05c for c.l. and 5c for l.c.l. Freight allowed. Spot, add 0.3c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 13.3c per lb of contained Si, carload packed 14.55c, ton lot 15.55c, less ton 16.7c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 15c per lb of contained Si carload packed 16.2c, ton lot 17.15c, less ton 18.2c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Over 97% Si and 1% max. Fe.) Eastern Zone, c.l., lump, bulk, regular 17.3c per lb of Si, c.l. packed 18.5c, ton lot 19.4c, less ton 20.4c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l. Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe) Contract basis fob Niagara Falls, N. Y., lump per lb cl 6.90c; ton lots packed, 7.40c; 200 to 1999 lb, 8.15c; smaller lots 8.65c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3½ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 12.5c per lb or briquet, carload packed 13.2c, ton lot 14.0c, less ton 14.9c; Central, add 0.25c for

(*Please turn to Page 166*)

Labor Unrest Developes in Metals Trade

American Smelting & Refining Co. workers at Perth Amboy plant reject company's wage increase offer and vote to strike. Operations maintained as negotiations are renewed

New York — Following a similar action taken by American Brass Co. and Chase Brass & Copper Co. late last month, other leading brass product producers have advanced prices. The advance in brass mill product prices was attributed principally to the higher labor costs resulting from recently signed wage agreements. This is significant in view of labor developments in another section of the metalproducing industry.

International Union of Mine, Mill and Smelter Workers (CIO) at the Perth Amboy, N. J., plant of American Smelting & Refining Co. has rejected a company offer to increase wages 10 cents an hour across-the-board plus "fringe" increases which would have amounted to about another 2 cents an hour. The union local voted to strike but has set no date, pending developments during renewed negotiations.

Another major development in nonferrous metal markets recently was the $13 an ounce advance posted by a leading refinery for platinum. The metal is now quoted $88 for large amounts and $91 for retail lots. Leading platinum dealers said that the supply of incoming platinum has slowed up considerably while there has been a moderate gain in industrial demand.

Copper — Pending outcome of present negotiations with workers in copper mines, producers are booking business cautiously for delivery in August.

Lead — No interruptions in operations at lead properties was reported up to late last week as a result of the failure of workers and producers to reach a new agreement following expiration of contracts on June 30 with the International Union of Mine, Mill and Smelter Workers.

Despite the threat of a further tightening in supplies, prices remained firm last week on the basis of 17.30c to 17.35c, St. Louis, for the common grade.

Consumption of lead-base scrap and residues by secondary smelters increased 4 per cent in March, according to the Bureau of Mines. During the month receipts of scrap at smelters' plants decreased 2 per cent and stocks declined 4 per cent, whereas recovery of usable metal, which totaled 45,821 net tons, increased almost 12 per cent over that reclaimed in February.

Smelters' receipts of scrap, which have increased each month since November, 1947, declined slightly in March to 55,832 tons. Although intake of most of the individual items advanced in varying amounts, battery-plate receipts decreased over a thousand tons. In the first three months of 1948, smelters received 99,872 tons of plates against 114,400 tons in the first quarter of 1947.

Battery plates smelted in March (35,176 tons) exceeded receipts by 1400 tons necessitating further withdrawal from inventories. This condition was also true of total lead-base scrap. Consumption remained high at 58,025 tons and stocks were reduced to 51,023 tons at the end of the month.

Receipts, consumption and stocks of tin-base scrap, each of which increased in March, totaled 627 tons, 554 tons and 1360 tons, respectively. Larger quantities of the item "tin scrap" were received and used in March than had been recorded in many months; stocks, however, decreased from 160 to 113 tons during the month.

Output of the secondary lead industry in March totaled 52,607 tons, the highest production so far recorded in 1948, and consisted of 39,839 tons of secondary pig metals, 7544 tons of fabricated products and 5224 tons of pig, bar or ingot containing 50 per cent or more of primary metal. The last figure includes the recoverable metal content of scrap consumed by primary producers and total output includes the primary metal used with scrap and secondary. The net total of 45,821 tons of secondary metals recovered in March from purchased lead and tin-base scrap was also the highest yet recorded in 1948 and exceeded February recovery by 4838 tons.

Zinc — Reconstruction Finance Corp. stocks of zinc, as well as other critical and strategic metals and minerals, have been frozen temporarily pending final determination of a policy of what can be done to accelerate accumulations for the national stockpile. Zinc allocations from the RFC stockpile have been averaging about 3000 tons a month, while acquisitions have been at approximately the same rate. Supplies continue tight. Prospects for improvement have darkened following the spread of labor unrest in the Tri-State district with properties of at least one large producer closed by a strike.

Imports of refined zinc in the form of blocks, pigs, etc. declined about 3000 tons in May to a total of 6815 net tons. Receipts from Canada amounted to 6474 tons, or about 500 tons under the April figure. Bulk of the decline in imports during May was accounted for by the fact that no imports were received from Italy or Japan in May against about 2900 tons brought in from those countries during April. Total imports of refined metal during the first five months of the year amounted to 34,694 tons against 35,786 tons in the like 1947 period.

Zinc ore imports continue to run behind those brought in last year, the zinc content totaling 97,386 tons in the first five months of this year against 131,724 tons in the corresponding period of 1947.

Exports of slab zinc in May amounted to 6346 tons against 5334 tons in April. During the first five months of this year 37,701 tons of metal were shipped abroad, of which 25,062 tons went to the United Kingdom. For the first five months of 1947 the exports to all destinations totaled 50,384 tons.

Tin—World mine production of tin in April declined to about 11,700 tons in April from 13,200 in March, according to the International Tin Study Group. The decline was attributed to smaller production in the Belgian Congo and a drop in exports from Bolivia. World production for the first four months of the year is estimated at 46,900 tons against 31,400 tons for the like 1947 period and 45,600 tons for the last four months of 1947.

World consumption of tin during March is estimated at 11,200 tons, or about the same as for the monthly average during the last six months.

Recent official figures on Malayan stocks are higher than the estimates published previously in the Bulletin and the incorporation of those new figures in the tables shows world stocks at higher levels than previously estimated by the agency. At the end of April overall stocks of metal and tin-in-ore are estimated at 130,400 long tons.

Stockpiling Plan Outlined

Washington — Office of Industry Co-operation has requested of and will receive from the Munitions Board a list setting forth the amounts of critical metals and minerals required for the national stockpile. Rear Admiral R. W. Paine will respresent the Munitions Board in negotiations with OIC concerning the voluntary agreements with the producers.

Procurement for the stockpile will be carried out under a procedure similar to that being used to fill needs of industry. It is expected that producing industry committees will be appointed which will work out an allocations program to cover the stockpile needs, if the required metals or minerals were determined to be available. Prices will be determined by negotiation with the Bureau of Federal Supply and the industry.

Aluminum Approved for Vents

Louisville, Ky. — Underwriting Division, Federal Housing Administration, has issued standards accepting aluminum tubing or standard IPS aluminum pipe for use in vent pipes in plumbing systems. The standards are contained in a revised issue of Bulletin UM-1, Aluminum Building Products, in which section 8 is devoted to the new application.

The standards specify that aluminum vent pipes may be used for dry vents where the lowest connection to the ferrous metal piping is not less than 6 inches above the flood rim of any plumbing on which the vent is installed. Proper cathodic protection for the aluminum pipe or fitting is required at each joint with ferrous metals. The alloys which are listed as acceptable include 2S, 3S, 61S, R361, and 63S. The minimum recommended wall thickness is 1/16-inch.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic, 21.50c, Conn. Valley; Lake, 21.62½c Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 19.50-20.00c; 88-10-2 (No. 215) 29.00c; 80-10-10 (No. 305) 25.25c; No. 1 yellow (No. 405) 15.25-16.00c. Prices include 25 cents per 100 lb freight allowance.

Zinc: Prime western 12.00c, brass special 12.25c, intermediate 12.50c, East St. Louis; high grade 13.00c, delivered.

Lead: Common 17.30-17.35c; chemical and corroding 17.40c, St. Louis.

Primary Aluminum: 99% plus, ingots 15.00-16.00c, pigs 13.50-15.00c; metallurgical 94% min. nom. 14.50c. Base prices for 10,000 lb and over, fob shipping point, freight allowed.

Secondary Aluminum: Piston alloy (No. 122 type) 22.75c; No. 12 foundry alloy (No. 2 grade) 22.50-23.75c; steel deoxidizing grades, notch bars, granulated or short: Grade 1, 23.75-24.25c; grade 2, 23.00-24.00; grade 3, 22.50-23.50c; grade 4, 22.00-23.00c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, fob Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 35.00; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 35.50c, fob Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 33.75c; 25-lb pigs, 35.25c; shot, 36.25c; "F" nickel shot or ingots, for addition to cast iron, 34.25c. Prices include import duty.

Mercury: Open market, spot, New York $76-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $20.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $1.75, del.; Special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 per lb for 550 lb (keg); $1.67 per lb for 100 lb (case); $1.72 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 74.62½c per ounce.

Platinum: $88-$91 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, fob mill.)

Sheet: Copper 35.18c; yellow brass 31.41c; commercial bronze, 95%, 35.05c; 90% 34.52c; red brass, 85% 33.48c; 80% 32.95c; best quality 32.34c; nickel silver, 18%, 43.42c; phosphotbronze, grade A, 5%, 54.15c.

Rods: Copper, hot rolled 31.28c; cold drawn 32.28c; yellow brass, free cutting, 25.94c; commercial bronze, 95% 34.74c, 90% 34.21c; red brass, 85% 33.17c, 80% 32.64c.

Seamless Tubing: Copper 35.22c; yellow brass 34.42c; commercial bronze 90% 37.18c; red brass 85% 36.39c, 80% 35.86c.

Wire: Yellow brass 31.70c; commercial bronze, 95% 35.34c; 90% 34.81c; red brass, 85% 33.77c, 80% 33.24c; best quality brass 32.63c.

Copper Wire: Bare, soft, fob eastern mills, c.l. 26.80c, l.c.l. 27.30c; weatherproof, fob eastern mills, c.l. 27.35c, l.c.l. 27.85c; magnet, delivered, c.l. 29.75-31.13c, 15,000 lb or more 30.00-31.38c, l.c.l. 30.50-31.88c.

ALUMINUM

(Revised price schedule pending; effective June 28)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	24.0	...	...
0.135-0.126	12-48	24.5	...	...
0.125-0.096	12-48	24.5	23.1	26.3
0.095-0.077	12-48	25.0	23.2	26.5
0.076-0.061	12-48	25.5	23.4	26.7
0.060-0.048	12-48	25.7	23.6	27.0
0.047-0.038	12-48	26.1	23.8	27.3
0.037-0.030	12-48	26.4	24.1	27.7
0.029-0.024	12-48	26.8	24.4	28.1
0.023-0.019	12-36	27.4	24.8	28.6
0.018-0.017	12-36	27.9	25.3	29.3
0.016-0.015	12-36	28.6	25.9	30.1
0.014	12-24	29.4	26.6	31.1
0.013-0.012	12-24	30.2	27.3	32.0
0.011	12-24	31.1	28.1	33.1
0.010-0.0095	12-24	32.1	29.0	34.3
0.009-0.0085	12-20	33.2	30.0	35.7
0.008-0.0075	12-20	34.4	31.1	37.1
0.007	12-18	35.7	32.3	38.8
0.006	12-18	37.0	33.5	42.6

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T	17S-T	—Hexagonal— R317-T	17S-T
0.125	45.0	44.0	...	...
0.156-0.203	38.5	37.5	...	...
0.219-0.313	35.5	34.5	...	...
0.344	34.0	33.0	...	...
0.375	33.0	32.0	42.5	40.0
0.406	33.0	32.0	...	...
0.438	33.0	32.0	42.5	40.0
0.469	33.0	32.0	...	...
0.500	33.0	32.0	42.5	40.0
0.531	33.0	32.0	...	...
0.563	33.0	32.0	40.5	38.0
0.594	33.0	32.0	...	...
0.625	33.0	32.0	40.5	38.0
0.656	33.0	32.0	...	...
0.688	33.0	32.0	40.5	38.0
0.750-1.000	32.0	31.0	37.0	35.5
1.063	32.0	31.0	35.5	34.0
1.125-1.500	31.0	30.0	35.5	34.0
1.563	31.0	30.0	...	...
1.625	30.0	29.0	34.5	33.0
1.688-2.000	30.0	29.0	...	...
2.125-2.500	29.5	28.5	...	...
2.625-3.375	28.5	27.5	...	...

LEAD

(Prices to jobbers, fob Cleveland, Pittsburgh)

Sheets: Full rolls, 140 sq ft or more, $20.85 per cwt.; add 50c per cwt., 10 sq ft to 140 sq ft; $1.25, less than 10 sq ft; $1, circles and segments. Pipe: Full coils, $20.10 per cwt; cut coils, $20.35. Traps and Bends: List price plus 52%.

ZINC

Sheets, 16.50c-17.00c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 15.25c-16.00c, fob mill, 36,000 lb and over. Plates, not over 12-in., 14.25c; over 12-in., 15.25c.

NICKEL

(Base prices, fob mill.)

Sheets, cold-rolled, 54.00c. Strip, cold-rolled 60.00c. Rods, hot-rolled 50.00c, cold-finished 55.00c. Angles, hot-rolled, 50.00c. Plates, 52.00c. Seamless tubes, 83.00c.

MONEL

(Base prices, fob mill.)

Sheets, cold-rolled 43.00c; No. 35, 41.00c. Strip, cold-rolled, 44.00c. Rods, hot-rolled 39.00c; cold-finished 44.00c. Angles, hot-rolled, 39.00c. Plates, 41.00c. Seamless tubes, 71.00c. Shot and blocks, 31.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00c; 100 lb to 4000 lb. 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9%, flake, fob Philadelphia, carloads, 26.00c; 5 tons and over 26.50c; 1 to 5 tons, 27.00c; less than 1 ton, 27.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 31.84c; oval, 31.34c; electrodeposited, 31.09c; cast, 30.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 44.00c, fob Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 16.00c; 1000 to 19,900 lb, 15.00c, fob Niagara Falls, N. Y.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.00c; over 250 lb, 24.00c, fob Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; fob Cleveland. Add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 25.00c; 275-lb, or 500-lb bbls. 23.00c, fob Cleveland.

Tin Anodes: Bar, 1000 lb and over 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 200 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb 121.75c; 200 to 499 lb, 122.25c; less than 200 lb, 123.75c, fob Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c. Prices fob Sewaren, N. J.

Zinc Cyanide: 100-lb drums 37.25c, fob Cleveland; 37.00c, Detroit; 36.00c, fob Philadelphia.

Stannous Sulphate: Less than 2000 lb, in 100 lb kegs, 100.00c, in 400 lb bbl. 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl. 98.00c.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)

Prices in cents per pound for less than 15,000 lb fob shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.625	15.375	14.750
Commercial Bronze			
95%	18.125	17.875	17.375
90%	17.625	17.375	16.875
Red brass			
85%	17.500	17.250	16.750
80%	17.250	17.000	16.500
Best Quality (71-79%)	16.625	16.375	15.875
Muntz Metal	14.750	14.500	14.000
Nickel silver, 10%	17.000	16.750	8.500
Phos. bronze, A	20.750	20.500	19.500
Naval brass	15.250	15.000	14.500
Manganese bronze	15.250	15.000	14.375

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 18.50, No. 2 copper 17.50, light copper 16.50, composition red brass 15.00-15.25, auto radiators 12.50-12.75, heavy yellow brass 10.75-11.00, brass pipe, 11.75-12.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.50-18.75, No. 2 copper 17.50-17.75, light copper, 16.50-16.75, refinery brass (60% copper), per dry copper content 16.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 17.00-17.25, No. 2 16.00-16.25, light copper 15.00-15.25, No. 1 composition red brass 13.25-13.50, No. 1 composition turnings 12.75-13.00, mixed brass turnings 7.50-7.75, new brass clippings 13.00-13.50, No. 1 brass rod turnings 10.00-10.50, light brass 6.75-7.25, heavy yellow brass 9.25-9.50, new brass rod ends 10.50-11.00, auto radiators, unsweated 10.25-10.50, cocks and faucets 10.25-10.50, brass pipe 10.25-10.50.

Lead: Heavy 15.50-16.00, battery plates 9.75-10.25, linotype and stereotype 17.00-17.50, electrotype 15.00-15.50, mixed babbitt 14.25-14.75, solder joints, 18.75-19.25.

Zinc: Old zinc 5.75-6.00, new die cast scrap 4.75-5.25, old die cast scrap 2.75-3.25.

Tin: No. 1 pewter 65.00-67.00, block tin pipe 83.00-84.00, No. 1 babbitt 51.00-54.00, siphon tops 50.00-52.00.

Aluminum: Clippings 2S 11.50-12.00, old sheets 10.00-10.50, crankcases 10.00-10.50, borings and turnings 4.50-5.00, pistons, free of struts, 10.00-10.50.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June Avg.	21.500	17.325	12.000	103.00	15.058	35.000	33.750	74.625
June 1-27	21.500	17.30–17.35	12.000	103.000	15.000	35.00	33.750	74.625
June 28-30	21.500	17.30–17.35	12.000	103.00	15.00-16.00	35.00	33.750	74.625
July 1-8	21.500	17.30–17.35	12.000	103.00	15.00-16.00	35.00	33.750	74.625

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, fob Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Busheling	40.00-40.50*
Nos. 1, 2 & 3 Bundles	40.00-40.50*
Machine Shop Turnings	36.50-37.00
Mixed Borings, Turnings	36.50-37.00
Short Shovel Turnings.	37.00-37.50
Cast Iron Borings	37.00-37.50
Bar Crops and Plate	47.50-48.00
Low Phos. Steel	47.50-48.50
Heavy Turnings	39.50-40.00

Cast Iron Grades

No. 1 Cupola	63.00-65.00
Charging Box Cast	53.00-54.00
Heavy Breakable Cast.	56.00-58.00
Unstripped Motor Blocks	52.00-53.00
Malleable	69.00-70.00
Brake Shoe	55.50-56.00
Clean Auto Cast	58.00-59.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	75.00-80.00
Axles	51.50-52.00
Rails, Rerolling	56.00-58.00
Rails, Random Lengths	54.00-56.00
Rails, 3 ft and under	60.00-60.50
Rails, 18 in. and under	62.50-63.50
Railroad Specialties	55.00-56.00
Uncut Tires	52.00-52.50
Angles, Splice Bars	53.00-54.00

* Plus applicable freight springboard.

CLEVELAND

No. 1 Heavy Melt. Steel	$39.50-40.00*
No. 2 Heavy Melt. Steel	39.50-40.00*
No. 1 Busheling	39.50-40.00*
Nos. 1 & 2 Bundles	39.50-40.00*
Machine Shop Turnings	34.50-35.00
Mixed Borings, Turnings	34.00-36.00
Short Shovel Turnings.	35.50-36.00
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	44.50-45.00
Punchings & Plate Scrap	44.50-45.00
Heavy Turnings	39.50-40.50
Alloy Free Turnings	37.50-38.50
Cut Structurals	46.00-49.00

Cast Iron Grades

No. 1 Cupola	67.00-69.00
Charging Box Cast	54.00-56.00
Stove Plate	56.00-58.00
Heavy Breakable Cast.	52.00-54.00
Unstripped Motor Blocks	58.00-60.00
Malleable	73.00-75.00
Brake Shoes	52.00-53.00
Clean Auto Cast	68.00-70.00
No. 1 Wheels	58.00-60.00
Burnt Cast	56.00-57.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*
R.R. Malleable	73.00-78.00
Rails, Rerolling	57.00-58.00
Rails, Random Lengths	56.00-57.00
Rails, 3 ft and under	61.00-63.00
Cast Steel	56.00-58.00
Railroad Specialties	53.00-55.00
Uncut Tires	51.00-53.00
Angles, Splice Bars	57.00-59.00

* Plus applicable freight springboard.

VALLEY

No. 1 Heavy Melt. Steel	$40.00-40.50*
No. 2 Heavy Melt. Steel	40.00-40.50*
No. 1 Bundles	40.00-40.50*
Machine Shop Turnings	34.50-35.50
Short Shovel Turnings.	36.50-37.00
Cast Iron Borings	36.00-36.50
Low Phos.	46.00-47.50*

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.50*

* Plus applicable freight springboard.

MANSFIELD

Machine Shop Turnings	$35.00-35.50
Short Shovel Turnings.	37.00-37.50

CINCINNATI

No. 1 Heavy Melt. Steel	$39.50
No. 2 Heavy Melt. Steel	39.50
No. 1 Busheling	39.50
Nos. 1 & 2 Bundles	39.50
Machine Shop Turnings	33.50
Mixed Borings, Turnings	32.50
Short Shovel Turnings.	35.50
Cast Iron Borings	34.50

Cast Iron Grades

No. 1 Cupola Cast	55.00
Charging Box Cast	43.00
Heavy Breakable Cast.	50.00
Stove Plate	47.00
Unstripped Motor Blocks	45.00
Brake Shoes	45.00
Clean Auto Cast	55.00
Drop Broken Cast	60.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50
R.R. Malleable	68.00
Rails, Rerolling	53.00
Rails, Random Lengths	50.00
Rails, 18 in. and under	60.00

DETROIT

(Brokers' buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$35.00-35.50
No. 1 Busheling	35.00-35.50
Nos. 1 & 2 Bundles	35.00-35.50
No. 3 Bundles	35.00-35.50
Machine Shop Turnings	29.00-29.50
Mixed Borings, Turnings	29.00-29.50
Short Shovel Turnings.	30.00-30.50
Cast Iron Borings	30.00-30.50
Punchings & Plate Scrap	40.00-40.50

Cast Iron Grades

No. 1 Cupola Cast	53.00-58.00
Heavy Breakable Cast.	47.00-52.00
Clean Auto Cast	53.00-58.00

BUFFALO

No. 1 Heavy Melt. Steel	$43.00-45.00
No. 2 Heavy Melt. Steel	39.75-40.25
No. 1 Busheling	39.75-40.25
No. 1 & 2 Bundles	39.75-40.25
Machine Shop Turnings	34.75-35.25
Mixed Borings, Turnings	34.75-35.25
Cast Iron Borings	35.50-36.00
Short Shovel Turnings.	35.50-36.00
Low Phos.	44.75-45.25

Cast Iron Grades

No. 1 Cupola	64.00-65.00
Mixed Cupola	55.00-62.00
Heavy Breakable Cast.	55.00-57.00
Malleable	70.00-75.00
Clean Auto Cast	62.00-64.00

Railroad Scrap

Rails, 3 ft. and under.	60.00-61.00
Railroad Specialties	51.00-53.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$42.00-43.00
No. 2 Heavy Melt. Steel	39.00
No. 1 Busheling	39.00
Nos. 1 & 2 Bundles	39.00
No. 3 Bundles	37.00
Machine Shop Turnings	34.00-35.00
Mixed Borings, Turnings	34.00-35.00
Short Shovel Turnings.	34.00-35.00
Bar Crop and Plate	47.50-48.00
Punchings & Plate Scrap	48.00-48.50
Cut Structurals	47.50-48.00
Elec. Furnace Bundles.	44.00-44.50
Heavy Turnings	43.00-43.50
No. 1 Chemical Borings	42.00-43.00

Cast Iron Grades

No. 1 Cupola Cast	63.00-65.00
No. 1 Machinery Cast.	67.00-68.00
Charging Box Cast	63.00-64.00
Heavy Breakable Cast.	63.00-64.00
Unstripped Motor Blocks	59.50
Malleable	76.00-78.00
Clean Auto Cast	64.00-65.00
No. 1 Wheels	68.00-70.00

NEW YORK

(Brokers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.50
No. 2 Heavy Melt. Steel	34.50
No. 1 Busheling	34.50
Nos. 1 & 2 Bundles	34.50
No. 3 Bundles	32.50
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	30.50-31.00
Punchings & Plate Scrap	40.00-41.00
Cut Structurals	40.00-41.00
Elec. Furnace Bundles.	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	55.00-57.00
Charging Box Cast	56.00-58.00
Heavy Breakable	56.00-58.00
Unstripped Motor Blocks	52.50-53.50
Malleable	68.00-69.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$31.90
No. 2 Heavy Melt. Steel	31.90
No. 1 Bundles	31.90
No. 1 Busheling	31.90
Machine Shop Turnings	28.90-30.00
Mixed Borings, Turnings	28.90-30.00
Short Shovel Turnings.	28.90
Bar Crops and Plate	35.00-37.00
Punchings & Plate Scrap	35.00-37.00
Chemical Borings	37.00-37.50

Cast Iron Grades

No. 1 Cupola Cast	50.00-52.00
Heavy Breakable Cast.	53.00
Stove Plate	50.00
Unstripped Motor Blocks	48.00
Clean Auto Cast	50.00-52.00

CHICAGO

No. 1 Heavy Melt. Steel	$39.00-39.50
No. 2 Heavy Melt. Steel	39.00-39.50
No. 1 Bundles	39.00-39.50
No. 2 Bundles	39.00-39.50
No. 3 Bundles	37.00-37.50
Machine Shop Turnings	34.00-34.50
Mixed Borings, Turnings	34.00-34.50
Short Shovel Turnings.	36.00-36.50
Cast Iron Borings	35.50-36.00
Bar Crops and Plate	46.50-47.00
Punchings	48.00-48.50
Elec. Furnace Bundles.	40.00-40.50
Heavy Turnings	38.50-39.00
Cut Structurals	44.00-44.50

Cast Iron Grades

No. 1 Cupola Cast	67.00-70.00
Clean Auto Cast	67.00-70.00
No. 1 Wheels	61.00-62.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.25-44.25
Malleable	75.00-76.00
Rails, Rerolling	54.00-55.00
Rails, Random Lengths	51.00-52.00
Rails, 3 ft and under	56.00-57.00
Rails, 18 in. and under	58.00-59.00
Railroad Specialties	52.00-53.00
Angles, Splice Bars	53.00-54.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$40.50-41.00
No. 2 Heavy Melt. Steel	37.50-38.00
Machine Shop Turnings	32.50-33.50
Short Shovel Turnings.	34.50-35.50

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	65.00-67.00
Mixed Cast	59.00-60.00
Heavy Breakable Cast.	55.00-56.00
Brake Shoes	57.00-58.00
Clean Auto Cast	65.00-67.00
Burnt Cast	59.00-60.00

Railroad Scrap

R.R. Malleable	65.00-70.00
Rails, Rerolling	50.50-52.50
Rails, Random Lengths	50.00-51.00
Rails, 3 ft and under	56.00-58.00
Uncut Tires	48.00-49.00
Angles, Splice Bars	55.00-56.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$37.50
No. 2 Heavy Melt. Steel	37.50
No. 1 Busheling	37.50
Nos. 1 & 2 Bundles	37.00
No. 3 Bundles	35.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	40.00
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	63.00
Stove Plate	60.00-62.00
No. 1 Wheels	59.00-61.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	38.00
R.R. Malleable	nom.
Axles, Steel	50.00
Rails, Rerolling	53.00-55.00
Rails, Random Lengths	45.00-48.00
Rails, 3 ft and under	53.00-55.00
Angles and Splice Bars	52.00-53.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$25.00
No. 2 Heavy Melt. Steel	*25.00
No. 1 Busheling	*25.00
Nos. 1 & 2 Bundles	*25.00
No. 3 Bundles	*19.00
Machine Shop Turnings	*15.50
Bar Crops and Plate	25.00
Cast Steel	25.00
Alloy Free Turnings	15.50
Cut Structurals	25.00
Tin Can Bundles	19.00

Railroad Scrap

No. 1 Heavy Melting	26.00
Axles	32.00
Rails, Random Lengths	26.50
Uncut Tires	33.50

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$26.00
No. 2 Heavy Melt. Steel	26.00
No. 1 Busheling	26.00
Nos. 1 & 2 Bundles	22.00-23.00
No. 3 Bundles	22.00-23.00
Machine Shop Turnings	19.00-21.00
Mixed Borings, Turnings	19.00-21.00
Punchings & Plate Scrap	26.00-28.00
Cut Structurals	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	40.00
Charging Box Cast	25.00
Heavy Breakable Cast.	24.00
Stove Plate	25.50
Unstripped Motor Blocks	24.00
Malleable	30.00
Brake Shoes	30.00
Clean Auto Cast	30.00
No. 1 Wheels	26.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	22.00
Railroad Malleable	30.00
Rails, Random Lengths	21.50
Angles and Splice Bars	23.00

LOS ANGELES

No. 1 Heavy Melt. Steel	$25.00
No. 2 Heavy Melt. Steel	25.00
Nos. 1 & 2 Bundles	25.00
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$22.00
No. 1 Bundles	22.00
Mechanical Bundles	20.00
Mixed Steel Scrap	19.00
Mixed Borings, Turnings	17.00
Rails, Remelting	28.00
Rails, Rerolling	26.00
Bushelings	17.00
Bushelings, new factory, prep'd	21.00
Bushelings, new factory, unprep'd	16.00
Short Steel Turnings	17.00

Cast Iron Grades*

No. 1 Cast	42.00-48.00
No. 2 Cast	35.00-37.00

* Removed from price control Aug. 9, 1947; quoted on basis of fob shipping point.

Sheets, Strip . . .

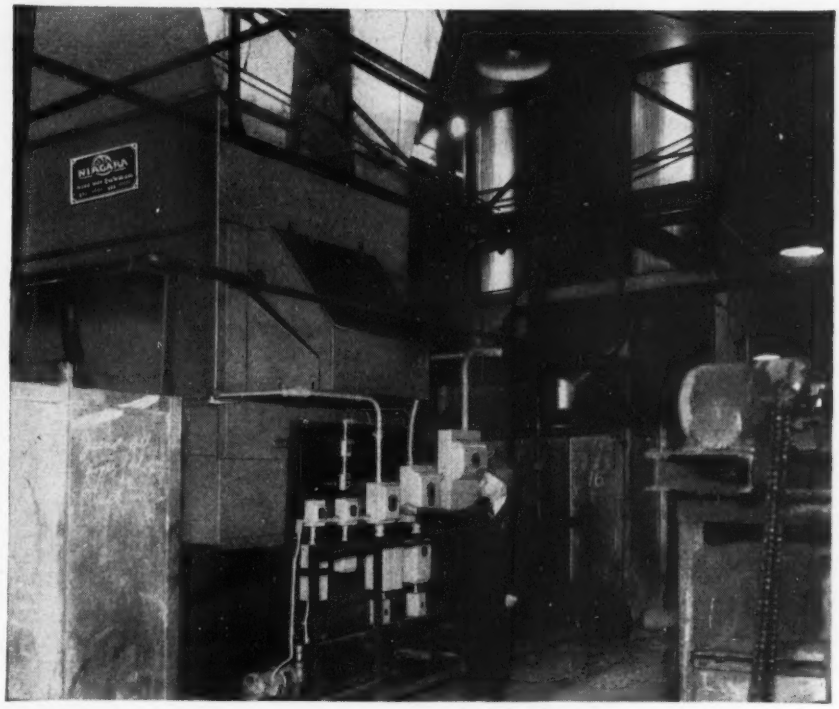
Consumers not included in voluntary allocation plan face tightening supply situation

Sheet Prices, Page 144

New York — Voluntary allocation programs are becoming unwieldy. While there are but three programs formally under allocation, namely freight car-builders, housing and atomic energy, additional consumer groups are pressing for more steel, including flat-rolled, and tonnage set aside for the above three is now affecting quotas and distribution to other users. This is apparent for the third quarter with the likelihood of becoming even more critical in fourth quarter distribution; question is raised as to how long steel can be satisfactorily distributed on a part priority and part open system. All flat-rolled classifications, with the possible exception of electro-coated in some categories, are falling short of their third quarter requirements; stainless is more extended, 10 to 12 weeks generally. At one time in the postwar period, deliveries were less than half that time. Producers in several instances have no hot-rolled open quotas this quarter and only excess tonnage to apply against allotments.

Boston — Cold-rolled strip mills down for vacation part of this month are not optimistic for the building of any substantial hot-rolled inventory during the interim. In carbon grades, notably low-carbon, cold reduction schedules will be sensitive to hot-rolled receipts indefinitely. Alloys match cold-rolling schedules better, but a tightening in those grades is developing. Adding to confusion is a mixed price structure. Cold strip is selling on a f.o.b. Worcester base and, in some cases, what is in effect a cost-plus policy. Demand is well in excess of production and little is heard from consumers as to price. Cold strip sellers are turning down orders from new accounts and slicing allocations to some old customers. Some fabricators of cold strip have not recovered from the impact of withdrawals from this area. They are from time to time able to place some tonnage with new suppliers, but frequently are unable to establish new customer relationships for a guaranteed tonnage.

Philadelphia — With prospective weakening of competitive factors, through adoption of mill or shipping point system of pricing, further dislocation in flat-rolled steel distribution looms ahead. Sparrows Point holds the key to the ultimate cost as far as carbon and galvanized sheets are concerned. These grades are currently selling in the Philadelphia area on a 26.78-cent per 100 pound freight rate in car lots Sparrows Point base. Mills in the Pittsburgh district and others have been meeting competition on the nearby Baltimore base under multiple basing point delivered policy. Thus, it is apparent that Sparrows Point holds the key for the future, although current demand for sheets is so great price is secondary. New orders for sheets this quarter under allocations are reduced by carryovers which apply



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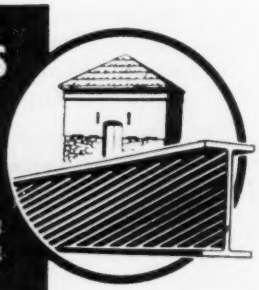

against quotas, although tonnages actually delivered to consumers will probably approximate those in the second quarter. The same situation is expected to confront distribution for the fourth quarter as substatial carryovers are likely. As a matter of fact there is no end in sight to flat-rolled shortages. Stainless sheets and strip deliveries have lengthened to 10 to 12 weeks and new requirements for that grade are bolstered by approximately 750 tons required for stainless passenger cars for Southern Pacific placed with Budd Co. One of the few sheet items experiencing a slackening in demand are electrical sheets for fractional horsepower motors. Producers of this type of electrical equipment have about matched demand, but there is no easing in transformers and other high grade silicon sheet grades.

Pittsburgh — Decision of United States Steel Corp. to establish f.o.b. mill selling policy is expected to be followed soon by other producers. Important consumer groups, such as automotive interests, will be more adversely affected by this action. The trend toward further decentralization of major steel consumers is expected to be encouraged under a f.o.b. mill selling practice. No comment was available from steel producers last week as to what the average freight absorption, in terms of dollars per net ton on the entire flat-rolled steel shipments, amounted to under multiple point basing system. Unofficially, it was variously estimated that this freight absorption amounted to from zero to over $5 a ton. Full impact of the new selling policy will not be felt until the industry enters a more competitive period, because availability of steel, rather than price, is the chief concern of consumers at present. Anticipated increase in steel prices still awaits settlement of the coal dispute and also the amount of increased costs resulting from the anticipated wage increase to steel workers within the near future.

Chicago — Fact that numerous manufacturing plants in this area are shut down for annual vacations or planning to close shortly is not lessening the demand for flat-rolled products. Consumers are pressing for deliveries and propose to improve their inventories during the vacation periods. Cancellations are trivial, a situation which is supported by the fact that numerous plants have been forced to reduce working shifts because of shortage of sheets and strip. Whether output of steel will be affected by current idleness of captive coal mines, remains to be seen. Thus far, no reductions in operations in this district have been scheduled, but a scaling down will come shortly unless mining is resumed within the next week.

Cincinnati — District sheet mills are producing at capacity in efforts to meet, insofar as possible, the insistent demands for tonnage. The tight third quarter schedule and the requests for delivery positions in the fourth quarter indicate little, if any, easing in the supply situation this year. No doubt price policies will be reviewed when new captive mine contracts are signed.

Seattle — Sizable tonnages of steel

sheet piling are involved in two public works jobs. U. S. Engineer Portland, Oreg., will open bids July 21 for a breakwater at Astoria, Oreg., 2420 feet long, requiring 4000 tons. About 400 tons are involved in the Washington state bridge, Wenatchee, general contract to General Construction Co., Seattle.

Steel Bars . . .

Bar Prices, Page 144

Pittsburgh — One cold-finished bar producer is no longer accepting new orders for carbon grades in the size range of 1-3/8 to 3 inches, because deliveries already are extended into the second quarter of next year. This situation, however, is not indicative of the general picture of order backlogs within the industry. Most companies are accepting orders within this size range for delivery late in the fourth quarter. Open-hearth alloy cold-finished bars are available for delivery early in the fourth quarter while electric furnace grades of this product are available for delivery late in this period. Most producers report operations continue retarded by the inability to obtain balanced inventories of merchant carbon bars. One interest stated that current output is below 50 per cent of capacity, although it is pointed out that expansion in its production facilities since prewar has increased its capacity by nearly this same amount.

New York — The delivery spread between alloy and carbon bars is narrowing. Consumers who have placed orders for alloys as a substitute for carbon because of availability in the past are now losing this advantage; in practice, most producers of alloys have been discouraging the use of that grade as a substitute for carbon stock and the growing stringency in alloys is not attributed to any substantial degree to substituting. The armament program is bringing out some trial orders for alloys. Most mills are not officially on quotas, but, in effect, now are operating on that basis. Cold-drawn carbon bars are more extended, reflecting allocation cutbacks in hot-rolled. The increase in alloy demand includes a spurt in stainless bar buying.

Boston — The increase in alloy steel price, five per cent by a leading producer, will affect some tonnage used by the antifriction bearing industry, the 52100 grade of bars and seamless steel tubing being included. Up to now bearing producers have not been too badly off for steel, their position being better than the average, but alloys are now beginning to tighten. Cold-finished carbon allocations this quarter are unexpectedly reduced in some directions which in part reflects limitations on hot-rolled to cold-drawers. Hot-rolled allocations are affected by carryovers, this tonnage being deducted in numerous cases. This fills quotas for the current quarter and nothing is being entered for fourth until a clearer picture is possible on the likely carryover for that period.

Philadelphia — Three of the major steel bar grades come to eastern Pennsylvania consumers on a Pittsburgh base, namely, hot and cold-finished carbon and cold-drawn al-

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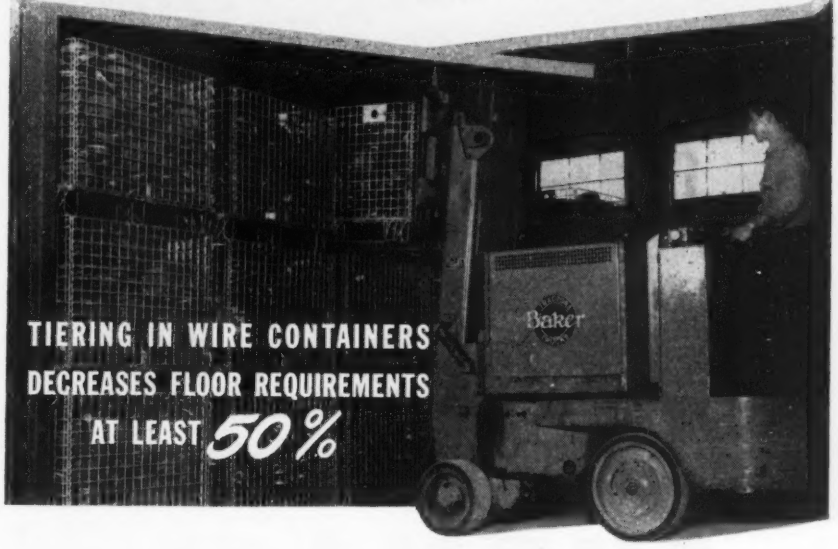

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loys. Concrete reinforcing bars are based at Sparrows Point; hot-rolled alloys, at Bethlehem. Adoption of the f.o.b. mill selling basis will have some ramification on costs and distribution, but probably less for the time being than for some products. Bulk of carbon bar tonnage carries freight of around $9.60 per ton to Philadelphia, although in the case of hot-rolled alloys the rate is only about $3.70 on Bethlehem - Philadelphia charge of 18.54 cents per 100 pounds in car lots. Demand for carbon bars is gaining on supply and alloys are tightening with deliveries more extended.

Structural Shapes . . .

Structural Shape Prices, Page 145

New York — If semifinished steel were available, structural mill capacity could soon wipe out backlogs and extended deliveries. But the steel for rolling is not available because of requirements for other products and there is nothing in sight to indicate more tonnage for structural rolling in the near future. Given the steel, structural mills have handled readily much larger tonnages than now confronts the industry. Fabricating shop backlogs are equivalent to five or six months' output and most are hampered by lack of balance in shape sizes. The freight car building program is taking a heavy share of special shape production, but numerous housing projects are specifying reinforced concrete.

Seattle — Fabricating plants report sufficient work in small orders on hand to maintain normal operations, but bidding on large jobs is out of the question in view of the continued scarcity of materials. Management is forced to pick and choose so as not to overstep available inventories. Fair backlogs are reported.

Isaacson Iron Works, Seattle, has taken 300 tons for a barker and chipper plant of Inland Empire Paper Co., Spokane, Wash. Other awards include 1200 tons surplus steel for six bridges for the Alaska Railroad, general contract placed; 800 tons for transmission towers for the Bonneville system to the American Bridge Co.; 600 tons to Poole & McGonigle, Portland, Oreg., for the Turnagain road project, Alaska.

Business pending includes 2214 tons for the Washington state bridge, Wenatchee, general contract awarded; 1200 tons for transmission towers, Tacoma light system, Bethlehem Pacific Coast Steel Corp. low; and unstated tonnages for state bridges in Montana, bids July 22.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 144

Seattle — Rolling mill production in this area is temporarily greatly reduced by holidays and a second equipment breakdown at the larger plant. Full operations will not be resumed until the latter half of July. Meanwhile, management is more concerned with speeding deliveries and reducing order backlogs. A considerable volume of desirable business in reinforcing bars has been bypassed. Mill inventories are extremely low. Large tonnages are in the market,

mostly for public works. Reclamation Bureau's program for the coming fiscal year involves large Columbia Basin projects, bids in the near future calling for approximately 30,000 tons reinforcing, 19,000 tons plates, 370 tons wrought iron pipe, 145 tons cast iron pipe, 10,600 tons shapes. These items are for the Coulee pump plant, main siphon, etc. Bids are due in August and September.

Large tonnages are required for the $5 million Veterans' hospital, Seattle, bids due Aug. 3; the Seattle public safety building, bids July 15; hospital at Caldwell, Idaho, bids July 20. Other tonnages pending are 750 tons for the Turnagain road job in Alaska and 500 tons for the Washington state bridge at Wenatchee.

Warehouse . . .

Warehouse Prices, Page 147

Cincinnati — Demand for warehouse steel continues unabated despite some vacation shutdowns. Most urgent appeals are for sheets and plates, shipments being far under district needs. Recent mill shipments made an improvement in supplies of structurals and cold-rolled bars.

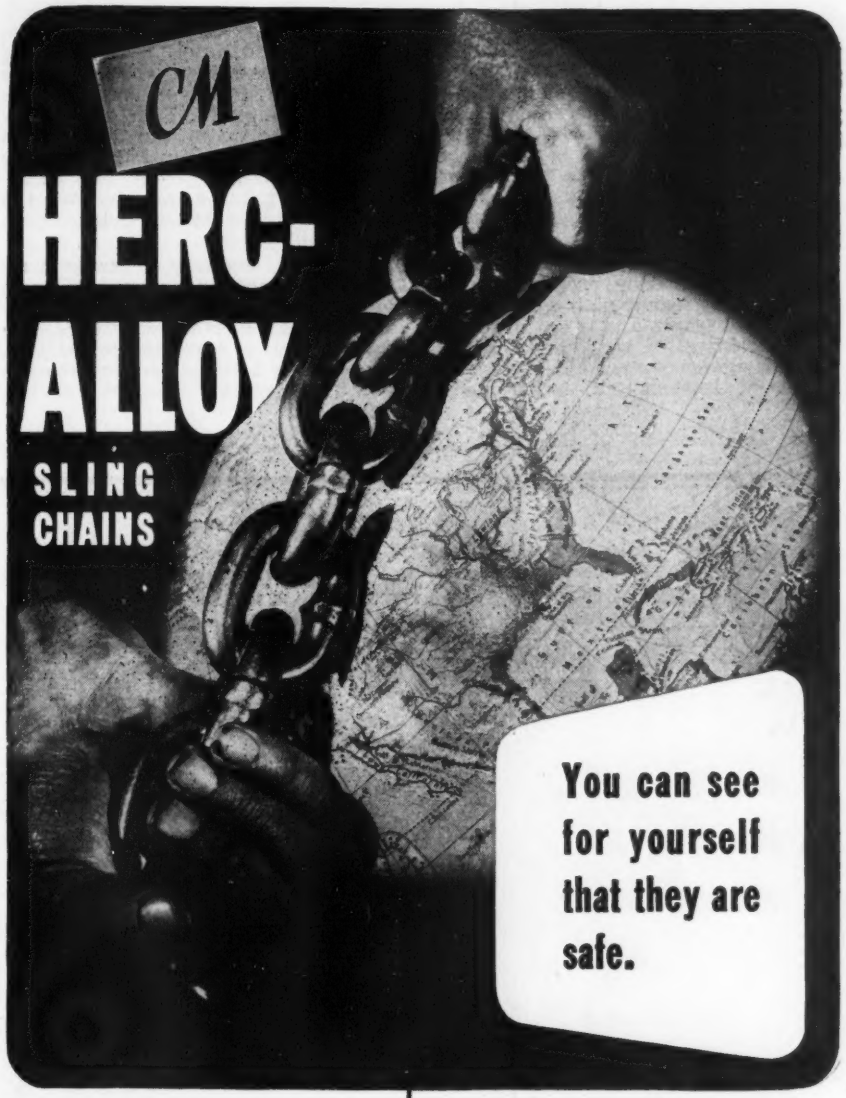
Plates . . .

Plate Prices, Page 145

New York — While plate order backlogs may not be as bulky as in some steel products, distribution is in a confused state, due in part to selective selling, a policy in effect over a period of many months with some mills. To the extent producers accepting light carbon plates have become over-crowded, a like policy is being forced upon them. Selective selling, large tonnages earmarked for voluntary distribution programs, notably freight cars, and demand for larger tonnage by integrated mill fabricating shops all contribute to a narrowing range for general distribution. Worst off are users of light carbon plates, 3/16 and 1/4-inch, including small tank builders and miscellaneous industrial fabricators. The tremendous demand for plates was filled during the war by the utilization of sheet mills for plate rolling, but the sheet demand currently existing makes any substantial switch unlikely now. Nevertheless, about 7000 tons a month are being produced on sheet mills by two producers.

Boston — Shipbuilding will soon show up in plate demand to a larger extent and, while nothing like the war tonnage which reached close to 12 million tons in 1944, is involved, about 250,000 tons is required by the end of the year. This includes all steel products for ships with plates predominating. Of this tonnage, the Quincy yard, more active on commercial ship construction, largely super-tankers, will take a substantial slice to be supplied by the integrated steel works, Bethlehem Steel Co. While this volume is not expected to come out of that mill's district plate allocations, it will eventually have an influence on the overall distribution.

Meanwhile, the railroad car program is getting a good share of plate



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production, probably better than 8,500,000 tons of all steel products this year. Freight car builders have at last reached the goal of 10,000 units a month. Several plate mills have withdrawn from this territory, taking no freight-absorbing tonnage unless by allocation which is negligible here. This gap has never been filled and the shortages of light carbon plates is intensified by selective selling.

Philadelphia — Allocations to established fabricating programs, notably railway car building, selective selling and requirements for integrated mill fabricating shops are narrowing tonnage of plates for general distribution. Users of light carbon stock are among those tightly squeezed. Large tonnage of plates is wanted for pipe fabrication. Contributing to the confusion in acquiring this product are price spreads, although at this time securing of tonnage appears to be more important than price. Award of contracts for two passenger cargo vessels for American Export Lines and five for the President Lines, taking a large tonnage, still pends.

Seattle — Scarcity of plates is restricting plant operations as much more work could be handled if materials could be obtained. There is a fair backlog of tank and boiler jobs. Some heavy tonnages are in the market, including 11,350 for schedule No. 2 Columbia Basin siphon; also, 7700 tons for two other phases of this project, bids soon. About 800 tons are involved in a reclamation job at Lewiston, Idaho, for the Orchards pipe line.

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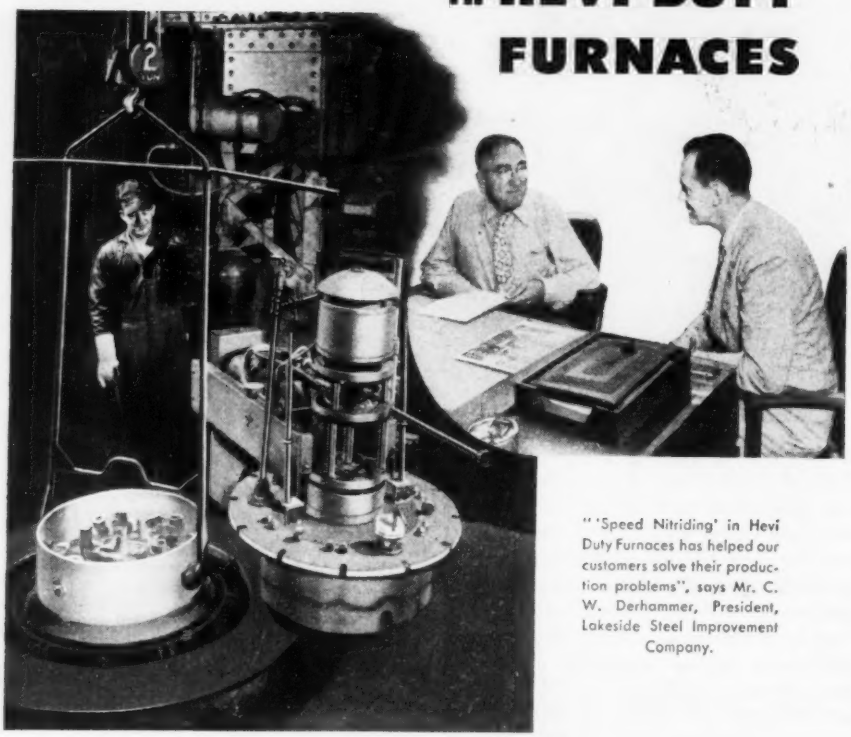

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Wire . . .

Wire Prices, Page 145

Boston—An increase in wire prices, covering specialties notably, appears in the offing as some mills are figuring higher costs. As regards wire and wire products, the attempt to stabilize and halt the inflation spiral appears to have petered out. Costs have not stayed put since May and there appears no way out except to post some increases, either applied directly or through a move toward an f.o.b. policy. Meanwhile, demand for wire is far in excess of supply for many products, including music wire in some sizes and rope, there being few openings for third quarter. A small volume is being taken from regular specialty customers for fourth quarter. Demand for wire, including valve spring, from the automotive industry, holds at a high level, but pressure is not as heavy as several months back. Aircraft is taking more.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 146

Pittsburgh — Very few beehive coke ovens operated last week, due to the strike in captive coal mines and sympathy strikes at commercial mines. What little beehive coke tonnage has been sold since July 1 will not be invoiced until a more complete picture in respect to costs under the new coal contract can be determined. It is variously estimated that coke prices will be advanced $1 to $1.25 a ton. No significant improvement in the overall coke supply is indicated through the third quarter. Many foundries have been forced to rely to a greater extent on beehive coke to maintain operations, even at the relatively low operating pace of 60 to 70 per cent of capacity. Limited supply of pig iron is another factor in this connection.

Buffalo — The leading coke producer in the area raised the price of oven foundry coke 90 cents a ton to $22.65, delivered Buffalo. The increase was attributed to higher material and labor costs. While merchant iron prices remained the same here, talk continues to seep through the trade that increases are in the offing.

Iron Ore . . .

Iron Ore Prices, Page 146

Cleveland — Lake Superior iron ore shipments from the upper lake ports increased slightly during the week ended July 5 to 2,763,359 tons from 2,738,550 tons for the preceding week and compared with 2,930,679 tons for the like 1947 week, according to the Lake Superior Iron Ore Association, this city. This brought the cumulative total for the season to date to 32,677,968 tons compared with 27,953,310 tons for the like pe-

riod a year ago.

Shipments from U. S. ports totaled 2,739,575 tons during the week ended July 5, or at an average daily loading rate of 391,367 tons, compared with 2,854,288 tons, or a daily rate of 407,755 tons, for the like week a year ago. The cumulative total for the U. S. ports this year was 32,289,396 tons, an increase of 4,855,267 tons over the total for the like 1947 period.

Pig Iron . . .

Shenango Furnace Co. advances prices $4 a ton to basis of $43 for basic

Pig Iron Prices, Page 146

Pittsburgh — Shenango Furnace Co. raised pig iron prices $4 a ton on July 7 at its Sharpsville, Pa., furnace, reflecting increased iron ore, coke and other production costs, and higher freight rates. The advance applies on basic, malleable and bessemer grades and would apply on foundry iron, although this grade is not being produced at this time. This boosts the price of basic to $43, malleable to $43.50, and bessemer to $44. Pittsburgh Coke & Chemical Co. increased its pig iron prices $3 a ton last month.

Many foundries closed last week for their annual two-week vacation, but expect to have little success in augmenting their depleted inventories of pig iron, coke or cast scrap during the shutdown. Indicated price increase in gray iron and malleable castings has not yet developed, despite a substantial increase in wages and other operating costs. The growing competitive market in the malleable castings industry and the sharp decline in order backlogs noted among gray iron jobbing shops are believed major factors holding up price action. Voluntary allocation of pig iron for foundries serving the federal housing program has not yet been agreed to officially by merchant producers, according to trade authorities.

New York — Allocation of iron for housing is not likely to seriously upset current distribution of limited supply. Most foundries now formally included in the allocation system have been getting fairly substantial quotas and, while slightly more tonnage is forthcoming for some melters, the impact is not expected to be heavy. In any event, any additional iron going to the allocation group will be at the expense of others because of the limited volume available. Soil pipe and heating plants will get more tonnage. Most foundries down for vacations are taking in iron, if shipped, enabling a few to better inventories slightly this month. Any resultant increase in inventories, however, will not materially ease the situation. Higher prices for iron are expected, probably after producers have more clearly established increased coke and other costs.

Boston — While few foundries in New England are affected by housing allocations for this month, effect in other districts is to weaken outlook for additional iron from outside foundries. Melt is down because of vacation closings, but most consumers are taking in iron shipped. This volume will not be large enough to contribute much to inventories. Higher costs for iron and sustained scrap prices have resulted in some additional markups in the price of castings.

Cleveland — Pig iron supplies of this district's foundries were reduced severely last week when one of Interlake Iron Corp.'s two furnaces at Toledo, O., unexpectedly went down and when a coke shortage forced American Steel & Wire Co.'s furnaces at Cleveland to suspend merchant iron shipments.

This situation forced at least one Cleveland foundry to close immediately and leaves others in a perilous position. It is expected the Toledo furnace will be out of production at least two months, and resumption of American Steel & Wire's shipments depends on settlement of the coal negotiations.

Chicago — Foundries in this area continue to press for prompt shipments of pig iron and coke. Some shops are closed for annual vacations but are taking in raw materials to bolster inventories. Shops which are operating have such low stocks that the maintenance of melts depends upon regular receipts of iron and coke. Supply of pig iron may be reduced shortly if blast furnace operators find it necessary to curtail because of coke shortage resulting

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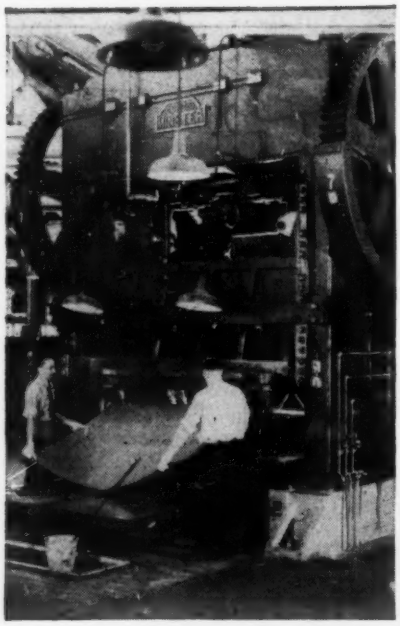

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from idleness in captive coal mines, although it is expected that work will resume under court order. So far, foundries have lost no iron as result of the blowing room explosion at South Works of Carnegie-Illinois Steel Corp. on July 3, which idled five blast furnaces. By coming midweek, three of the stacks will be restored, and within three weeks the other two will resume.

Buffalo — District pig iron production jumped 6½ points to 94 per cent of capacity as the Bethlehem Lackawanna plant completed a major repair job on its "B" stack which resumed operations after being shut down for about six months. The furnace will be kept on basic iron as the mill endeavors to replenish scrap reserve by heavier usage of iron in open hearths. Further tightness hit the local merchant iron market as a number of Pennsylvania buyers, who were dependent on the Alan Wood stack that was shut down in Pennsylvania, made inquiries for iron here. With full allocations for the month already made, all such inquiries went begging.

Cincinnati—Allocations of pig iron for July indicate no imminent relief from the tight supply situation. The pressure for shipments is temporarily modified because of the number of foundries shut down early this month for vacations. None has issued a holdup order against pig iron, however. Prospects for a lighter melt this month may bring about a moderate easing in oven foundry coke, but it is not likely ovens will take on any new customers.

Refractories . . .

Refractories Prices, Page 146

Pittsburgh — Refractory brick output was curtailed sharply last week due to a strike of about 1600 men in plants of Harbison-Walker Refractories Co., General Refractories Co. and Hiram Swank & Sons Inc. However, partial operations were maintained, since several hundred employees remained at work at some plants. A new working agreement, involving wage increase equivalent to 13 cents an hour, has been reached between refractory brick producers and the United Construction Workers Division of UMW, but CIO representatives want a 15-cent package. Companies reportedly have offered 14.50 cents an hour increase.

Ferroalloys . . .

Ferroalloy Prices, Page 147

Canton — Ohio Ferro-Alloys Corp., this city, has advanced the price of Siminal 1 cent a pound, effective as of July 1. Base prices for the product in lump form are as follows, f.o.b. Philo, O.: Carload, bulk, 10.50c, packed 11.00c; ton lots, packed, 11.25c; less than ton lots, packed, 11.75c per pound of alloy, f.o.b. Philo, O., with freight allowed to destination, except to those points taking a freight rate in excess of the St. Louis rate; to such points the equivalent of the St. Louis rate will be allowed. Standard packages are 50-gallon barrels; add extra charge of 5 cents for 30-gallon barrels.

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Scrap . . .

Scrap Prices, Page 150

Tie-in sales threaten formula price structure of Buffalo market. Tone strong in other districts

Buffalo — While formula prices continue to prevail on the surface in the scrap market, actually most of the business being transacted is at higher levels when consideration is given to reciprocal trades and three-corner deals. According to a survey only a limited amount of scrap is changing hands here strictly on the formula basis with no tie-in sales of some sort. For this reason, formula prices are often mythical quotes that actually don't show the real market.

The tip-off on what is going on is disclosed by the fact that dealers are constantly operating in the open-market and paying above formula prices to cover orders. Dealers claim that in some instances they are incurring losses, but this is not a common practice to the extent that such buying is reported. Dealers find contract tie-in clauses often make it possible for them to pay over the formula and still come out all right. Dealers are often the third party in deals where a steel consumer guarantees a mill scrap in return for a finished product. The steel buyer readily pays above the formula to a dealer to cover the scrap end of the deal.

Further indications that the formula pricing policy might be crumbling come from the surrounding territory. For weeks two Pittsburgh area mills have been making substantial purchases in the outlying districts, which usually ship here, at prices ranging from $1 to $2.50 above formula quotations. Local dealers claim they must have contracts which make it possible to compete with this outside buying to protect local consumers.

Pittsburgh — No mill scrap buying of significant tonnage was reported last week. Formula prices remain intact on the relatively small tonnage orders placed. However, with the flow of scrap slightly slower and with the third round of price increases being posted in other commodities, there is a definitely stronger price tone developing. Overall scrap supply remains scarce with further tightening indicated throughout July as result of mass vacations among metalworking companies. Intensive efforts are reported toward increasing shipments of battlefield scrap to this country, but many problems in regard to collection, purchasing price, amount needed to stimulate European steel mill operations, etc., have yet to be solved. Little change in scrap inventory situation is noted, although some consumers have been forced to slightly reduce their stocks during the last 30 days. Mills continue to critically inspect incoming material, as reflected in the number of car rejections.

New York — Demand for steel making scrap has not been softened by mill curtailments due to coal mine strikes. Consumers are pressing for shipments and buying in steady volume. Inventories are generally not

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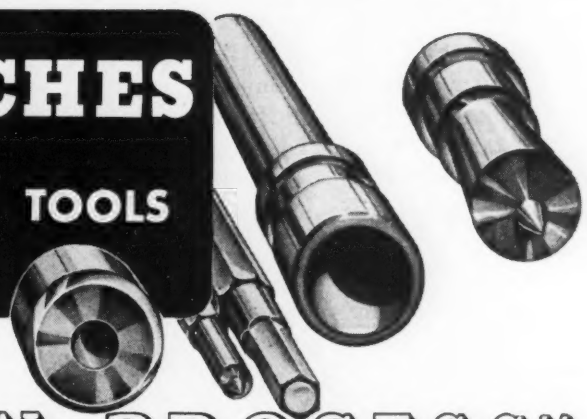

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too heavy. Prices are steady at the formula level, but new tonnage is coming out less actively, partly a seasonal development.

Cast buying is inclined to slacken. Inventories with some foundries are heavier and melt is off this month.

Philadelphia — Steel scrap prices are firm and steady, but have not broken formula levels except in rare instances. Consumers are pressing for shipments and new buying holds well, although there is a seasonal lag in yard receipts, both in collections and industrial tonnage. There is no tendency to hold back open-hearth scrap for higher prices and there is doubt that higher prices would bring out more tonnage. Relatively, users of cast are in a better inventory position than users of steel scrap. Some small foundries have about reached the top limit in the ratio of scrap to pig iron in melts and are taking in cast more rationally in terms of availability of iron, which is limited.

Boston — Some heavy melting steel scrap is selling above the formula, although the latter level holds for most transactions. For third quarter accumulations at the Watertown Arsenal, high dealer bid was $34.40 for unprepared melting steel. Machine shop turnings are generally held at $28.90, shipping point, but as high as $30 is reported. Cast buying is slow, reflecting in part better inventories and shop vacations.

Detroit — Considerably stronger undertone has developed in the market for open-hearth scrap, although local mills are continuing to adhere to the formula price. Some brokers are known to be booking tonnages for smaller mills outside this area above quoted prices and, following the purchase by a principal Chicago mill at above-formula levels, additional pressure is felt here. Scattered sales at higher prices are usually kept quiet and there is considerable speculation over why these mills should offer premium prices in view of the fairly comfortable supply of scrap now moving. Cast iron grades remain nominal and there are no signs of any substantial improvement in demand.

Chicago — A decidedly strong tone is observed in the scrap market here, but steel mills are determinedly adhering to their price schedule. Offerings are not in the volume of recent weeks, a direct reflection of vacations in many manufacturing plants, consequently mills are finding it difficult to build inventories as they should be doing at this season. Scrap is simply not available in the volume necessary to sustain high level consumption and inventory building at the same time. Reports are heard of brokers acquiring material at prices $1 above the mill schedule for heavy melting steel, but this material is being used to fulfill commitments or is moving out of the territory. With pig iron scarce, cast grades are holding firm.

Cincinnati — Iron and steel scrap market is less active, due in part to vacations. Effect of the wheat harvest season is holding down country scrap collections. Some segments of the market are bullish on contention that tonnage in stock and in view this fall is inadequate for the winter melt. The bullish view was further supported by higher prices received for specialties on a railroad list than were received one month ago.

Seattle — Satisfactory receipts of scrap are reported by consuming plants here. The base price is unchanged at $26. Inventories are mounting and the outlook is much improved. Shipments from the Portland area, which have been interrupted for more than a month by flood waters, have been resumed.

Rails, Cars . . .

Track Material Prices, Page 145

New York — Domestic freight cars delivered during June totaled 10,387, the American Railway Car Institute announced last week. Total deliveries for the first six months came to 55,345. Of the June deliveries, 7737 were from the car builders and 2650 were built in railroad shops.

In announcing that the 10,000-car monthly goal had been achieved for the first time since the current car-building program was instituted in March, 1947, S. M. Felton, president of the American Railway Car Institute, said:

"Despite the achievement of a peak month, the outlook for the future is just as discouraging as was indicated by Col. J. Monroe Johnson, director of the Office of Defense Transportation, in his statement on June 29. Last month's production reflected exceptionally high steel receipts in March after the usual time-lag for fabrication and assembly of cars. Because steel receipts have dropped since then, it is most unlikely that the 10,000-car level can be maintained during the months ahead."

Cars on order as of June 30 totaled 122,165 compared with 109,006 cars one year earlier.

Canada . . .

Toronto, Ont.—While there has been no slackening in demand for iron and steel here, there has been some decline in interest in the markets recently. This is partly credited to the summer holiday season.

Steel production in Canada is being maintained at record-breaking levels and at maximum production on basis of raw material supply. All finishing mills are not at capacity, but this is due to steel shortage. Steel Co. of Canada Ltd. is preparing to put its cold rolling mill in operation, but in order to keep this unit operating it will be necessary to draw steel from the hot mills, thus cutting down output of hot-rolled sheets and possibly carbon bars.

Recently revised prices have had little or no direct effect on supply and demand. Consumers are in need of steel and, while most buyers in this country are not sufficiently interested to pay gray market prices, they have made no complaints regarding recent authorized price boosts. No cancellations have been reported. Steel mills are booked solidly through third quarter on most lines, but small lot orders continue

to appear at regular intervals. Mill shipments are going forward to consumers on the quota basis and, while no cuts have been announced for third quarter, producers are not too optimistic regarding last quarter.

Sheetmakers have not yet advanced prices on black and galvanized sheets, despite authorization from Wartime Prices and Trade Board, but all bookings are on a price to be made known at time of shipment basis. Sheet demand is heavy and producers, with books filled to the end of September, have withdrawn from the market.

Demand for steel plate is moving steadily ahead and domestic output falls considerably behind requirements. Consumers are obtaining approximately a third of their plate supply by importations from the United States, but the overall supply is still well below requirements.

While some mills continue to take orders for carbon bars, others are declining further commitments, reporting no surplus capacity for the next three months. There has been some minor easing in supply of carbon bars recently, but not sufficient to bring supply and demand to an equal basis, and there is a possibility that supply will become shorter as the year advances. Alloy steel bars are in fair supply and producers have not increased prices.

Structural steel shapes are becoming more difficult to obtain and there has been some slowing in deliveries from the United States to Canadian fabricators. Domestic output, confined principally to the smaller sizes, is being quickly absorbed and no surplus stocks are reported.

Merchant pig iron deliveries have been speeded up recently, but supply still is below foundry requirements. Shipments now are running around 10,000 tons per week. Improvement in supply of iron for merchant melters is due to special arrangements by the government with blast furnace operators. Under the new ruling, however, melters in need of extra iron are required to send their request through Ottawa and, if approval is granted, the order is passed along to the producer for filling. It is stated that this additional pig iron for the merchant trade is being made available at the expense of steelmaking, although it is understood the government is arranging for larger supply of steelmaking scrap, which will have to come through importations.

Scrap receipts have improved over the early weeks of this year, but are far from meeting requirements of the mills or foundries. Collections are being made in rural communities, but collectors are not showing much interest in steel grades, pointing out that under existing ceilings there is no profit. Offerings from domestic sources are about at their maximum under existing market conditions, which means the consumers' buying price for heavy melting of $22 ceiling has a tendency to keep large tonnages off the market, that otherwise might reach consumers if steel scrap prices were more in line with finished steel or iron scrap quotations. Imported scrap is much more costly to consumers than that from Canadian sources.

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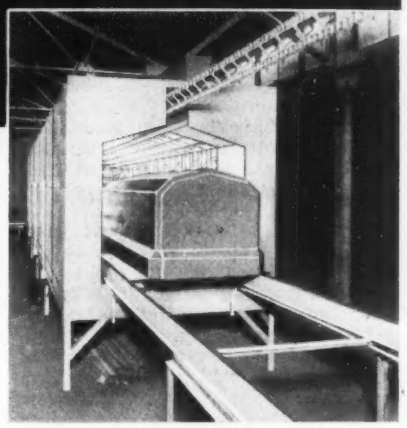

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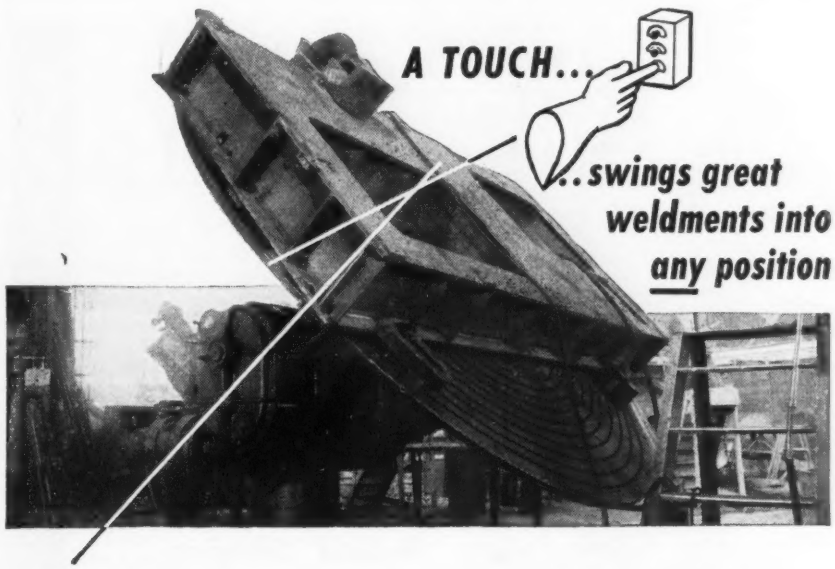

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Major U. S. Steel Mills

Pittsburgh — Action by the United States Steel Corp. last week, changing the pricing policy of its subsidiaries to the basis of f.o.b. mill, places increased importance on the location of mills in relation to customers' plants. The following tabulation lists the location of the corporation's major finishing mills and the principal products which can be produced at each mill. However, all products listed are not necessarily being produced at those points at the present time.

AMERICAN STEEL & WIRE CO.

Cleveland, O.: Wire rods; plain, galvanized, tinned and cold-rolled wire; galvanized strand; cold-rolled sheets; hot-rolled bars; cold-finished bars; hot-rolled, cold-rolled, galvanized and tinned strip.

Donora, Pa.: Hot-rolled bars; cold-finished bars; wire rods; plain, galvanized and barbed wire; nails and staples; woven fence; reinforcement mesh; galvanized strand.

Duluth, Minn.: Heavy structural shapes; hot-rolled bars; wire rods; plain, galvanized and barbed wire; nails and staples; woven fence; bale ties; hot-rolled strip; fence posts; galvanized strand; steel castings.

Joliet, Ill.: Hot-rolled bars; angle bars and joints; track spikes; wire rods; plain, galvanized and barbed wire; nails and staples; woven fencing; poultry netting; bale ties; hoops; electric-welded reinforcement mesh; bolts and nuts.

New Haven, Conn.: Cold-rolled strip; plain and galvanized wire; rope and strand wire.

Rankin, Pa.: Plain, galvanized and barbed wire; nails and staples; woven fence; hoops.

Worcester, Mass.: Hot-rolled bars; cold-finished bars; cold-rolled and galvanized strip; wire rods; plain, galvanized, tinned, and cold-rolled wire; nails; springs; rope and strand; steel and brass castings; plain and galvanized wire; rope and strand.

Trenton, N. J.: Plain and galvanized wire; rope and strand.

Waukegan, Ill.: Cold-finished bars; plain, galvanized, cold-rolled and tinned wire; galvanized strand; springs.

CARNEGIE-ILLINOIS STEEL CORP.

Clairton, Pa.: Heavy structural shapes; universal plates; hot-rolled bars; iron castings.

Duquesne, Pa.: Hot-rolled bars, including reinforcing; seamless tube rounds.

Braddock, Pa.: Heavy structural shapes; light and heavy rails; splice bars and tie plates.

Munhall, Pa.: Heavy structural shapes; steel piling; sheared and universal plates; fitted sheet piling; fitted sheet piling; fitted structural material; fitted railroad ties.

McDonald, O.: Heavy structural shapes; universal plates; hot-rolled bars, including reinforcing; skelp; wire rods; hot-rolled black sheets; hot-rolled strip; slack barrel hoops; automobile wheel disks.

Youngstown, O.: Heavy structural shapes; hot-rolled bars, including reinforcing; hot-rolled strip.

Gary, Ind.: Heavy structural shapes; sheared and universal plates; rails, splice bars, and tie plates; hot-rolled bars, including reinforcing; seamless tube rounds; wire rods; rolled wheels; axles; black plate; hot-dipped tin and terne plate; electrolytic tin plate; hot and cold-rolled sheets and strip; galvanized sheets; long terne sheets.

South Chicago, Ill.: Heavy structural shapes; sheared and universal plates; hot-rolled bars; cold-finished bars; seamless tube rounds.

Johnstown, Pa.: Bolts, nuts and rivets; grinding balls; rolled welded steel products; special trackwork; resilient wheels; iron castings.

Dravosburg, Pa.: Sheared plates; black plate; hot-dipped tin and terne plate; electrolytic tin plate; hot and cold-rolled sheets.

Vandergrift, Pa.: Hot-rolled galvanized and electrical sheets; long ternes.

McKeesport, Pa.: Stainless sheared plates; stainless hot-rolled sheets; cold-rolled and polished sheets.

NATIONAL TUBE CO.

McKeesport, Pa.: Skelp, seamless tube rounds; butt-weld and seamless pipe and tubes; galvanized pipe.

Ellwood City, Pa.: Seamless tube rounds; seamless pipe and tubes; mechanical tubing; boiler tubes.

Lorain, O.: Butt-weld and seamless pipe and tubes; conduit; galvanized pipe; seamless tube rounds; skelp; girder rails; splice bars.

TENNESSEE COAL, IRON & RAILROAD CO.

Bessemer, Ala.: Heavy structural shapes; bars and light shapes; universal plates.

Ensley, Ala.: **Rails;** forgings and castings.

Fairfield, Ala.: Heavy structural shapes; sheared and universal plates; rails, splice bars and tie plates; track spikes; hot-rolled bars; hot-rolled strip; hot-rolled black sheets; galvanized sheets; black plate; hot-dipped tin and terne plate; electrolytic tin plate; wire rods; plain and galvanized wire; nails and staples; woven fence; bale ties; galvanized strand; axles; forgings; bolts and nuts; cotton tie strip; standard panelbilt parts; culverts; steel castings.

GENEVA STEEL CO.

Geneva, Utah: Heavy structural shapes; sheared plates.

COLUMBIA STEEL CO.

Pittsburg, Calif.: Hot-rolled bars, including reinforcing; hot-rolled and galvanized sheets; hot and cold-rolled strip; tie plates; wire rods; plain, galvanized and barbed wire; nails and staples; woven fence wire; black plate; tin plate; springs; rope and strand; steel castings.

Torrance, Calif.: Heavy structural shapes; hot-rolled bars, including reinforcing; hot-rolled and galvanized sheet; hot-rolled strip; steel castings.

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LEHIGH STRUCTURAL STEEL CO., ALLENTOWN
PHILA. RANGE BOILER & TANK CO., COATESVILLE
COLUMBIA MALLEABLE CASTINGS CO., COLUMBIA
AMERICAN TINNING & GALVANIZING CO., ERIE
HANLON-GREGORY GALVANIZING CO., PITTSBURGH
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STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1200 tons, six bridges for Alaska railroad; material furnished by government from surplus; general contract to Cascade Contractors Inc. and Alton Phillips, Seattle, low, $448,196.

800 tons, transmission towers for Bonneville Power Administration, to American Bridge Co., Pittsburgh.

600 tons, Turnagain road project, Alaska, to Poole & McGonigle, Portland, Oreg., general contract to Lytle-Green Co. by Public Roads Administration, low $4,129,425.

300 tons, barker and chipper plant for Inland Empire Paper Co., Spokane, Wash., to Isaacson Iron Works, Seattle.

250 tons, building, Norristown State Hospital, Pennsylvania, to American Bridge Co., Pittsburgh.

223 tons, bridge, sec. 0707.1 GF, Cook county, Ill., for state, to Bethlehem Steel Co.

200 tons, bridge, sec. 0606.2 HF, Cook county, Ill., for state, to Bethlehem Steel Co.

200 tons, building, Roddis Co. Inc., Chicago, to Joseph T. Ryerson & Son Inc., Chicago.

160 tons, warehouse, Illinois Bell Telephone Co., Chicago, to Duffin Iron Co., Chicago.

100 tons, Pennsylvania railroad bridge, Kokomo, Ind., to American Bridge Co., Pittsburgh.

100 tons, building, Randolph Paper & Bag Co., Chicago, to Duffin Iron Co., Chicago.

100 tons, boiler house, Armour & Co., McCook, Ill., to Duffin Iron Co., Chicago.

STRUCTURAL STEEL PENDING

10,600 tons, Columbia Basin projects; bids to Bureau of Reclamation, Denver, August and September.

2214 tons, also 61 tons castings, state bridge, Wenatchee, Wash.; general contract to General Construction Co., Seattle, low, $1,853,684.

2100 tons, state office building, Des Moines; project deferred.

1500 tons, Vine St., bridge, Philadelphia; Golder Construction Co., Philadelphia, low on general contract.

1200 tons, transmission towers, Tacoma Light system, Bethlehem-Pacific Coast Steel Corp., Seattle, low.

600 tons, warehouse, United States Rubber Co., Chicago; bids in.

450 tons, high school building, Philadelphia; John McShange Co., Philadelphia, low.

200 tons, building, Van Cleef Bros., Chicago; bids July 2.

160 tons, warehouse, Harrisburg, Pa., bids in.

Unstated, 14 steel bridges, including 204 and 354-feet spans, in various counties; bids to State Highway Commission, Helena, Montana, July 22.

Unstated, miscellaneous steel, grating, platform, etc. for Cascade dam, Boise project, bids to Bureau of Reclamation, Denver, July 27; sch. No. 2311.

REINFORCING BARS . . .

REINFORCING BARS PLACED

570 tons, new store building, Weiboldt Stores Inc., Evanston, Ill., to Joseph T. Ryerson & Son Inc., Chicago.

500 tons, paper storage warehouse, R. R. Donnelley & Sons Co., Chicago, to Truscon Steel Co., Youngstown, O.

REINFORCING BARS PENDING

30,000 tons approximately, Columbia basin siphon and other projects; bids to Bureau

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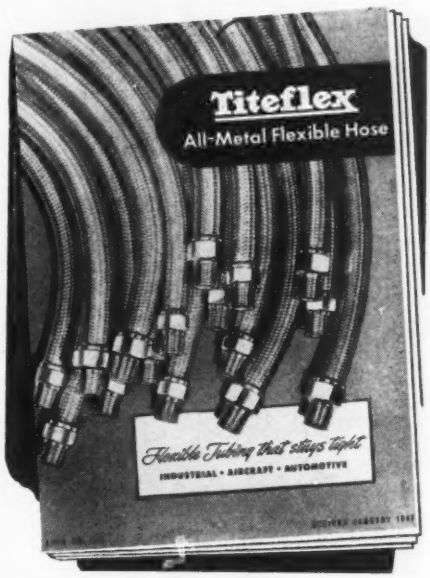

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- **Flexible Bronze Tubing**
- **Flexible Monel Tubing**
- **Flexible Stainless Steel Tubing**
- **Flexible Inconel Tubing**
- **Temperature Range of Titeflex Tubing**
- **Pressures Sustained by Titeflex Tubing**
- **Fitting Selection**
- **Pipe and Copper Tube Applications with Titeflex Equivalents**

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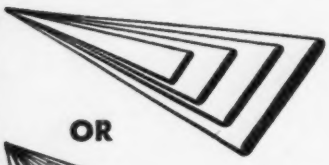

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PAGE STEEL AND WIRE DIVISION
AMERICAN CHAIN & CABLE

In Business for Your Safety

of Reclamation, Denver, in August and September.

2500 tons, Chatham Park Tower apartment, Chicago; Sherry-Richards Co., contractor.

750 tons, Turnagain road project, Alaska; general contract to Lytle-Green Co.

500 tons, Washington state bridge, Wenatchee; general contract to General Construction Co., Seattle.

480 tons, Jewish hospital, Minneapolis; bids June 30.

370 tons, staff housing, University of Illinois, Urbana, Ill.; bids July 7.

360 tons, office building and warehouse, Horder's Inc., Chicago; Coath & Goss Inc., Chicago, contractor.

181 tons, Schoitz Memorial hospital, Waterloo, Iowa; bids of June 7, over estimate, rejected.

170 tons, building, Home for Aged Jews; Chicago; bids in.

150 tons, state office building, Des Moines; project deferred.

100 tons, Washington state bridges, Skagit county; general contract to C. V. Wilder, Mt. Vernon, low.

Unstated, $5 million, 300-bed Veterans Hospital, Seattle; bids to U. S. Engineer, Aug. 3.

Unstated, Memorial Hospital, Caldwell, Idaho; bids July 20.

PLATES . . .

PLATES PENDING

19,000 tons approximately, siphons and other construction, Columbia Basin project; bids to Bureau of Reclamation, Denver, in August and September.

4000 tons, breakwater at Astoria, Oreg., bids to U. S. Engineer, Portland, July 31.

800 tons, Orchards irrigation project, Lewiston, Idaho; bids to Bureau of Reclamation, Denver, July 13.

400 tons Washington state bridge, Wenatchee; General Construction Co., Seattle, general contractor.

PIPE . . .

CAST IRON PIPE PENDING

145 tons, Grand Coulee pumping plant; bids to Bureau of Reclamation, Denver, soon.

WROUGHT IRON PIPE PENDING

370 tons, Grand Coulee pumping plant; bids to Bureau of Reclamation, Denver, soon.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chicago, Rock Island & Pacific, 10 diesel-electric locomotives for suburban service, to Electro-Motive Division, General Motors Corp., LaGrange, Ill.

RAILROAD CARS PLACED

Alabama Great Southern, 150 gondola cars, to Pressed Steel Car Co., Pittsburgh.

Atchison, Topeka & Santa Fe, 250 cars, including 40 refrigerators and 50 seventy-ton gondolas, to own shops, Topeka, Kans.

The Clinchfield, 500 fifty-ton hoppers, to American Car & Foundry Co.

Monongahela Connecting Railroads, 100 seventy-ton gondolas, to American Car & Foundry Co., New York.

Southern Pacific, 78 stainless steel passenger cars, including 30 all-room sleepers, 20 chair, 6 baggage-mail, 6 dining, 6 lounge, 5 dormitory, and 5 coffee-shop lounge cars, to Budd Co., Philadelphia.

Western Maryland, 50 fifty-ton box cars, to Greenville Steel Car Co., Greenville, Pa.

RAILROAD CARS PENDING

Delaware & Hudson, 100 seventy-ton covered hoppers.

Great Northern, 6 fifty-two seat coaches, 12 forty-eight seat coaches, 11 sleeping cars and 1 observation lounge.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

CLEARWATER, CAL.—Electric Auto-Lite Co., Toledo, O., has awarded a contract to Al-Co Co., 5423 Flemish Village Lane, Los Angeles, for construction of a battery manufacturing plant.

GLENDALE, CALIF.—Superweld Corp., 768 Hawthorne St., has been formed by Walter T. Wells with a capital of $500,000 to do electric furnace brazing and to make silver-soldered steel and nonferrous parts and assemblies, hand trucks and other wheeled goods.

LOS ANGELES—L. & M. Shape Burning Inc. has been formed by Michael Chuchua and associates with a capital of $75,000 as a metal cutting firm. Corporation is represented by Vincent C. Hickson, 458 S. Spring St.

ILLINOIS

CHICAGO—International Harvester Co., 180 N. Michigan Ave., has awarded a $174,000 contract to R. H. Burkhardt, 180 N. Michigan Ave., for interior plant alterations.

SKOKIE, ILL.—Farley Mfg. Co., 2650 Beldon St., Chicago, has awarded a contract to B. J. Regnell Co., 1005 Belmont Ave., Chicago, for construction of a factory and office.

MARYLAND

BALTIMORE—Mutual Chemical Co. of America, 1348 Block St., plans to construct a $140,000 chemical manufacturing plant at 1201 Block St.

MICHIGAN

IRON MOUNTAIN, MICH.—Wisconsin-Michigan Power Co., 137 W. Mill St., Appleton, Wis., has awarded a $2 million contract to C. R. Meyers & Sons Co., 50 State St., Oshkosh, Wis., for construction of a power plant and dam on the Menominee river near here.

PLYMOUTH, MICH.—Whitman & Barnes Division, United Drill & Tool Corp., 40600 Plymouth Rd., has awarded a $2,500,000 contract to Austin Co., 16112 Euclid Ave., Cleveland, for the design and construction of a plant and office.

MISSOURI

ST. LOUIS—Missouri-Pacific Railroad, R. P. Hart, chief engineer, Missouri-Pacific Bldg., will build shops at the Rankin Yards costing $146,300 and shops at Ewing Ave. costing $121,100.

ST. LOUIS — Standard Pipeprotection Inc., George B. McComb, president, has awarded a $500,000 contract to Hercules Construction Co., 8808 Ladue Rd., for erection of a new plant on a 20-acre tract at 3000 S. Brentwood Blvd., Brentwood.

NORTH CAROLINA

CHARLOTTE, N. C.—B. F. Goodrich Co. has awarded a $100,000 contract to J. B. Thomas & Sons for an office and warehouse building.

FOREST CITY, N. C.—Laurel Hill Corp. has awarded a $100,000 contract to R. E. Carpenter, Shelby, for construction of a manufacturing plant.

OHIO

BARBERTON, O.—Ohio Brass Co. has completed a remodeling and expansion program at its plant at Park Ave. & Ninth St. which is part of a $200,000 expansion program designed to boost production capacity here 25 per cent.

CLEVELAND—Lincoln Electric Co., James F. Lincoln, president, plans a $10 million plant between St. Clair Ave. and the Nickel Plate Railroad. Plant eventually will consist of 25 acres of building under roof and will quadruple present Lincoln facilities which will be abandoned.

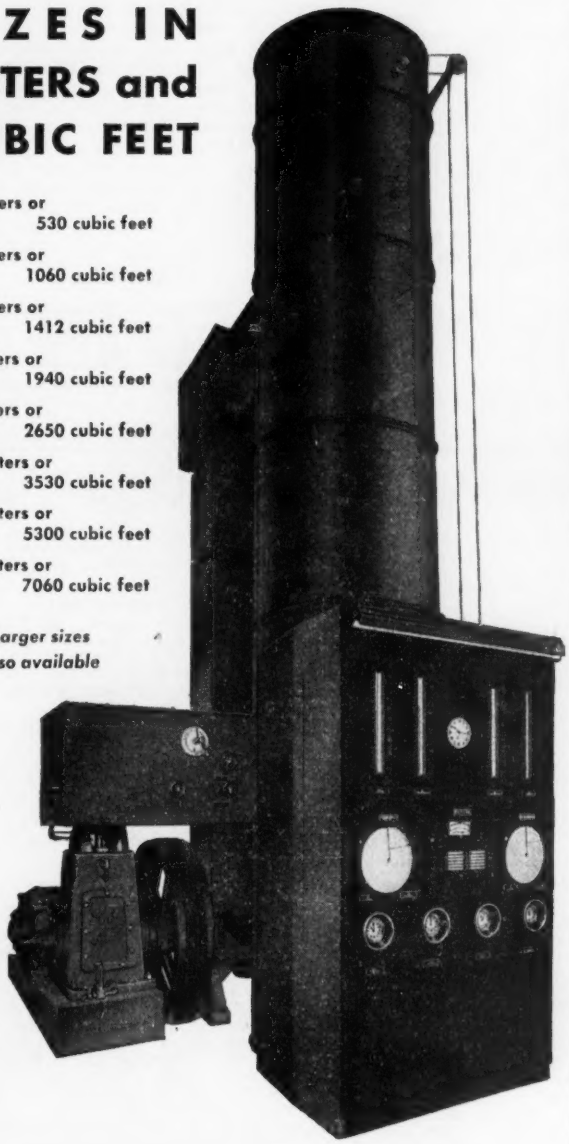
CLEVELAND — Columbia Metal Stamping

Expansion Engine Type
Medium Pressure
OXYGEN and NITROGEN
PRODUCING PLANTS

SIZES IN METERS and CUBIC FEET

15 Meters or 530 cubic feet
30 Meters or 1060 cubic feet
40 Meters or 1412 cubic feet
55 Meters or 1940 cubic feet
75 Meters or 2650 cubic feet
100 Meters or 3530 cubic feet
150 Meters or 5300 cubic feet
200 Meters or 7060 cubic feet

Larger sizes also available



Built in standard size as listed above in single and double rectification units. Streamlined panel provides quick visibility of all gauges. Compact design—requires minimum of floor space.

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CYLINDERS AND GAS PRODUCING EQUIPMENT
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with
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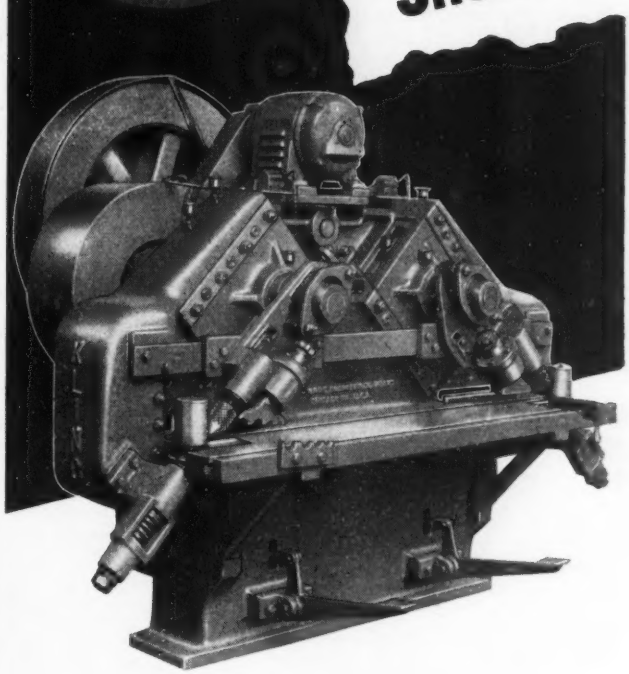

Especially designed for high speed, high production shearing. Will handle flat and round mild steel bars in addition to structural and bar angles. Round bars and bar angles are sheared on the left side, while the right side is used for structural angles and flat bars.

These special shears are equipped with automatic hold downs and "Y" type roller supports, also a removable guide for flat bar shearing. *Recommended for straight shearing only.* Mitreing can be accomplished by removal of holddowns. Available in four sizes.

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Manufacturers of Rotary, Plate, Bar Shears, Combination Shears, Punches and Copers, Single and Double End Punches, Angle, Beam, Bar and Plate Benders, High Speed Friction Saws.

Co., A. E. Koch, president, plans a $60,000 addition.

CLEVELAND—Electrolized Tap Corp. of Ohio, 1650 Collamer St., has been formed by Norman Noble and associates with a capital of $250,000 to engage in a business of hardening tools and dies by means of a recently invented process.

CLEVELAND—Sheet Metal Products Co., 1380 E. 170th St., plans a $56,000 factory addition at 21200 St. Clair Ave.

CLEVELAND—Kelly Plating Co., 10316 Madison Ave., recently suffered $50,000 damages from fire which injured electric generators, plating equipment and machinery.

CLEVELAND—Nottingham Steel Co., W. 45th and Division Ave., will erect a $50,000 warehouse.

CLEVELAND—Eaton Mfg. Co., E. 65th St. and Central Ave., plans a factory addition.

LORAIN, O.—Lake Terminal Railroad has begun work on its $325,000 diesel maintenance shop at Vine Ave. and 28th St.

MASSILLON, O. — Griscom-Russel Co., 661 Third St., manufacturer of industrial machinery, has begun construction on a $60,000 warehouse.

RAVENNA, O.—A. C. Williams Co., 267 Hazen St., plans to enlarge its foundry with a $45,000 addition.

TOLEDO, O.—Disalle Plating Co., Wayne St., plans to build a $100,000 factory.

TOLEDO, O.—Gulf Refining Co., Nicholas Bldg., has awarded a $4,883,000 contract to M. W. Kellogg Co., 225 Broadway, New York, for construction of two petroleum stills at 2935 Front St.

WARREN, O.—Mullins Mfg. Corp. will spend $278,000 on modernizing its Warren and Salem plants. Warren improvements, to cost $163,000, including two 200-ton presses and new ventilating systems.

OKLAHOMA

OKMULGEE, OKLA. — American Window Glass Co. has awarded a $2 million contract to Rust Engineering Co., Pittsburgh, for construction of a plant for the manufacture of sheet glass.

OREGON

RAINIER, OREG.—Pacific Power & Light Co. plans construction of a $75,000 substation here.

PENNSYLVANIA

ERIE, PA.—Erie Malleable Iron Co. will spend $108,000 on steel roofing for its foundry at 1201 Cherry St.

LANSDALE, PA. — Trys-Kris Co., Seventh and Washington Aves., has awarded a $75,000 contract to Hatfield Industries, Hatfield, for construction of a machine shop.

NANTICOKE, PA.—General Cigar Co. Inc., W. Church St., has awarded a $125,000 contract to Sordoni Construction Co., 45 Owen St., Forty Fort, for a factory addition.

PHILADELPHIA—Yarnall-Waring Co., 102 E. Mermaid Lane, has awarded an $80,000 contract to Joseph R. Farrell Inc., 1422 Market St., for construction of a machine shop addition.

STOWE, PA.—Stanley G. Flagg & Co. Inc. has rejected bids of May 25 for a $70,000 plant alteration and addition project.

TEXAS

DALLAS, TEX.—Dallas Power & Light Co., 1506 Commerce St., will build a $160,000 tower for cooling a power generator.

FT. WORTH, TEX.—American Cyanamid Co., c/o W. L. Spalding, 30 Rockefeller Plaza, New York, has awarded a $115,000 contract to Morgan Bell Associates, Lake Charles, La., for a 1-story addition to its chemical plant at 600 N. Jones St.

FT. WORTH, TEX.—Cook Paint & Varnish Co., A. T. Seymour Jr., vice president, 220 Danciger Bldg., has awarded a $129,578 contract to B. B. Adams for construction of a warehouse and office building.

GRAND PRAIRIE, TEX.—Chance-Vought Aircraft Corp., 550 Main St., Stratford, Conn., is remodeling and altering its aircraft plant here at a cost of $500,000.

HOUSTON, TEX.—Reed Roller Bit Co., 5125 Clinton Dr., has awarded a $232,000 contract to Schneider Construction Co., 3004 W. Dallas St., for erection of a plant addition.

HOUSTON, TEX.—Southwestern Machinery & Equipment Co., c/o Charles E. Woodall, 119 Main St., plans a warehouse, factory and site improvements on a 32-acre tract on La Porte Highway off Central Ave. Cost will be $1,855,000.

PASADENA, TEX.—Southern Acid & Chemical Co. has awarded a $6 million contract to Leonard Construction Co., Chicago, for the design and construction of a sulphuric acid plant near here.

VIRGINIA

NEWPORT NEWS, VA.—Chesapeake & Ohio Railway, L. T. Nuchols, chief engineer, 823 Main St., Richmond, has awarded an $88,000 contract to Enterprise Electric Co. for a transformer substation and connecting power lines.

PRICES OF LEADING FERROALLOYS PRODUCTS

(*Concluded from Page* 147)

c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8.7c per lb of briquet, c.l. packaged 9.5c, ton lot 10.3c, less ton 11.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l. bulk 8.75c per lb of briquet, c.l. packed 9.55c, ton lot 10.35c, less ton 11.25c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 5.1c per lb of briquet, c.l. packed 5.25c, ton lot 6.7c, less ton 7.6c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 5.25c c.l. packed 6.05c, ton lots 6.85c, less ton 7.75c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 17.50c per lb of alloy, carload packed 19.0c, ton lot 19.8c, less ton 20.8c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 16.25c per lb of alloy, carload packed 16.45c, ton lot 19.35c, less ton 20.85c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 93c; No. 6, 63c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.25 per lb of contained W; 200 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.75c, ton lot 7.5c, less ton 8.35c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.40c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone contract, 100 lb or more. 1" x D, $1.20 per lb of alloy, freight allowed. Less than 100 lb $1.30; Central, add 0.75c; Western add 2.9c, freight allowed. Spot, add 5c.

Borosil: (3 to 4% B, 40 to 45% Si), $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, carload packed 17.25c per lb of material, ton lot 18.00c, less ton 19.25c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l., and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%; Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 39c per lb of alloy, ton lot 41c, less ton 43c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 15.0c per lb of alloy, ton lot 15.75c, less ton 17.0c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Graphidox No. 4: (Si 56%, Ca 5%, Ti 9%) C.l. packed, 16.50c per lb. of alloy; ton lots 17.90c; less ton lots 19.40c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%; V-7, Cr 28-32%, Si 15-21%, Mn 14-16%) C.l. packed, 12.95c per lb. of alloy; ton lots 14.60c; less ton lots 15.85c, fob Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 11c, ton lots 11.25c, smaller lots 11.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base): Gross tons per carload, fob sellers' works, Mt. Pleasant, or Siglo, Tenn.; $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.